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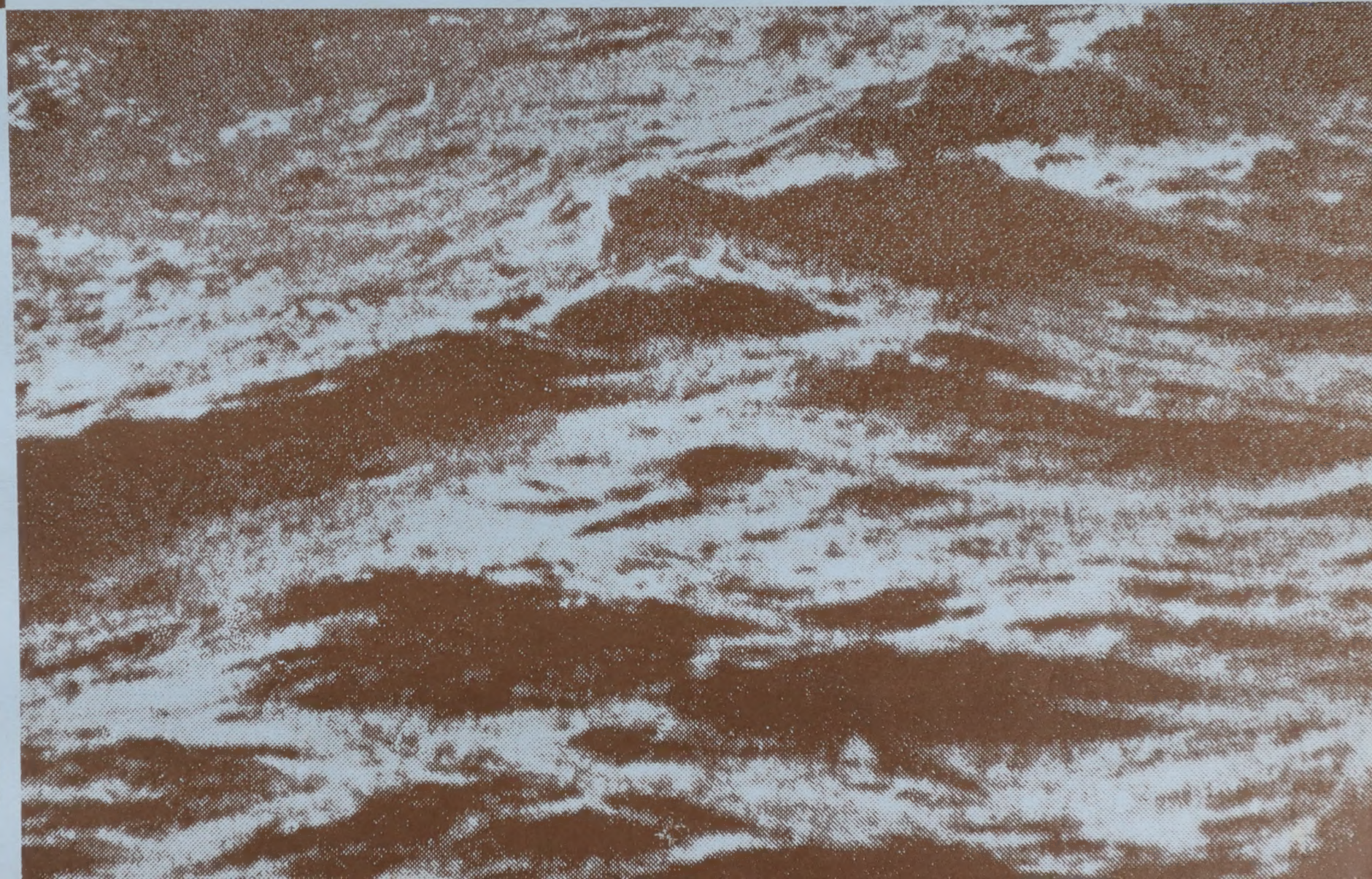

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UNITED STATES DEPARTMENT OF COMMERCE
Maurice H. Stans, *Secretary*

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Dr. Robert M. White, *Administrator*

NATIONAL MARINE FISHERIES SERVICE
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FOREWORD

The Department of Commerce's National Marine Fisheries Service publishes the monthly journal *Commercial Fisheries Abstracts* as one means of communicating to the fishing industry and allied groups the status of current fishery research. The research includes the biological aspects of fishery science as well as technological studies dealing with aquatic resource supply, harvesting, processing, utilization, and distribution.

Commercial Fisheries Abstracts contains summaries of selected articles from trade, engineering, and scientific journals dealing with the entire spectrum of fishery science. The publication is designed to serve the needs of fishery scientists, engineers, and managers in industry, academic institutions, and government by supplying timely information on current progress in fishery research and technology.

27-12-1971

0.2 (9.6) LECTURES ON MARINE ACOUSTICS.
VOLUME I: FUNDAMENTALS OF MARINE ACOUSTICS

Caruthers, Jerald W. (Department of Oceanography, Texas A&M University, College Station, Tex.)
Sea Grant Publication No. TAMU-SG-71-403, vi + 156 pp. (June 1971)

A 1-week course in Marine Acoustics was given at Texas A&M University the week of June 28, 1971. As background for the more advanced lectures, the lecture notes used for the course "Marine Acoustics," regularly given by the Department of Oceanography, were presented. Volume I is a compilation of these notes; Volume II,"Selected Advanced Topics in Marine Acoustics," is a compilation of lecture notes prepared for the more advanced, specialized topics.

The major subject headings listed in the table of contents for Volume I are as follows:

Introduction
- Sound in the Sea
- The Nature of the Acoustic Field
- Logarithmic Units
- Spectral Notions

Electroacoustic and Chemical Transduction
- Electroacoustic Transducers
- Explosive Sources

Hydrophones, Projectors, and Calibration
- Transducer Responses
- Calibration

(over)

0.33 NON-ENZYMATIC BROWNING I. REACTIONS OF ALIPHATIC CARBONYL DERIVATIVES WITH AMINES IN MODEL SYSTEMS

Janíček, G., and J. Pokorný (Institut für Lebensmittelchemie, Chemisch-Technologische Hochschule Praha 6, Czechoslovakia)
Zeitschrift für Lebensmittel-Untersuchung und -Forschung 145, No. 3, 142-147 (March 1971)

Carbonyl derivatives (produced by lipid oxidation, e.g. aldehydes and hydroxy ketones) can react with free amino groups to form various colored condensation products. The reaction is slow at room temperature but is accelerated by a moderate increase in temperature so that it is complete in 1 hr. The main initial products formed have a composition corresponding to imines. In media containing an excess of aldehydes (particularly in an acid environment), compounds containing two or more aldehyde radicals for each amino group are formed by further aldolization of primary reaction products. With hydroxy ketones, no reactions analogous to aldolization take place--one hydroxyketo group can bind two amino derivatives.
[7 figures, 17 references] FTP

0.35 EFFECT OF TEMPERATURE AND ZINC ON RIBONUCLEIC ACIDS IN CARP LIVER. 1. METHODS FOR DETERMINING NUCLEIC ACIDS

Evreinova, T. N., N. A. Lutsenko, and N. S. Stroganov (U.S.S.R.)
Chemical Abstracts 74, No. 21, 108681q (May 24, 1971)

0.36 BIOSYNTHESIS OF WAX ESTERS IN FISH. METABOLISM OF DIETARY ALCOHOLS

Sand, D. M., Jean L. Hehl, and H. Schlenk (The Hormel Institute, University of Minnesota, Austin, Minn. 55912) (Address correspondence to H. Schlenk)
Biochemistry 10, No. 13, 2536-2541 (June 22, 1971)

The lipids of the roe of the tropical fresh-water fish opaline gourami (Trichogaster cosby) consist mainly of wax esters; the body lipids consist mainly of triglycerides. The authors demonstrated earlier that dietary fatty alcohols and acids are efficiently incorporated and interconverted in the opaline gourami [Biochemistry 8, 4851 (1969)]. Those experiments were carried out with ^{14}C-labeled compounds and did not show the pathways of oxidation and reduction that may be involved when dietary alcohols are incorporated into wax esters. One part of the alcohols was oxidized to acids that appeared in the wax esters and other lipids but another part was found as alcohols in the wax esters of the roe. This second part may have been esterified directly or may have been oxidized to acid and then reduced again to alcohol for esterification. The authors postulate that possibly both of these pathways were concurrently active in the formation of wax esters in the tropical fish. The present study was carried out to examine these two possibilities.

Palmityl and oleyl alcohols labeled with ^{3}H in position 1 were fed to the opaline gouramis as such or together with U-^{14}C-labeled alcohols. After 24 hr. the fish were sacrificed and the lipids of the body and roe were analyzed.

The level of ^{3}H in the alcohol bound as wax esters in the roe indicated that nearly all the dietary alcohol had been oxidized and then part of it had been reduced again to alcohol for esterification. But, some direct esterification of the

 (over)

0.4 TERATOGENIC EFFECTS OF A CHELATING AGENT AND THEIR PREVENTION BY ZINC

Swenerton, Helene, and Lucille S. Hurley (Department of Nutrition, University of California, Davis, Calif. 95616)
Science 173, No. 3991, 62-64 (July 2, 1971)

The increased use of metal-binding compounds in medicine has stimulated interest in the potential toxic effects of specific chelating compounds. In the present study, purified diets containing 2 and 3% EDTA (ethylenediaminetetraacetic acid) salts were fed to pregnant rats to determine the effect of dietary EDTA on the development of the embryo. In addition, the influence of dietary zinc in preventing the possible effects of EDTA was also examined.

When female rats ingested the chelating agent EDTA during pregnancy, reproduction was impaired and resulted in congenitally malformed young. When EDTA was fed to the rats from day 6 to day 21 of gestation, all the full-term young showed gross congenital malformations. The malformations were prevented by simultaneous supplementation of the diet with 1,000 p.p.m. of zinc.

Deficiencies of the trace element zinc are probably rare in man because of the ubiquitous presence of the element in plants and animals. However, the authors point out that increases in environmental levels of metal-binding substances or zinc antagonists may induce zinc deficiency and interfere with the fundamental processes in which the trace element plays an essential role.
[1 figure, 2 tables, 18 references] FTP

0.33 NON-ENZYMATIC BROWNING II. REACTION OF FURFURALDEHYDE WITH ANILINE IN MODEL SYSTEMS

Pokorný, J., and G. Janíček
Zeitschrift für Lebensmittel-Untersuchung und -Forschung 145, No. 4, 217-222 (April 1971)

The nonenzymatic reactions of solutions of furfuraldehyde and aniline were examined. A red colored compound formed at first; it then turned into yellow and brown products. This reaction proceeded slowly at a low temperature and rapidly at a high temperature. The red product is composed of two molecules of aniline and three of furfuraldehyde. The structure of the yellow compounds is much more complicated; they may contain 15 to 80% of furfuraldehyde and 85 to 20 mol.% of aniline. The derivatives having extremely low or high furfuraldehyde content were formed in the later reaction stages.
[3 figures, 3 tables, 13 references] FTP

0.5 (7.8) CATERED CONVENIENCE FOODS--PRODUCTION AND DISTRIBUTION PROBLEMS AND MICROBIOLOGICAL STANDARDS

Angelotti, Robert (Division of Microbiology, Food and Drug Administration, Washington, D.C. 20204)
Journal of Milk and Food Technology 34, No. 5, 227-231 (May 1971)

Microbiological standards for foods are being proposed as an aid to control transmission of foodborne disease and to assure maintenance of good sanitary practices during processing, distributing, and preparation for service of foods. The Food and Drug Administration is conducting microbiological surveys of restaurant-prepared meals, machine-vended foods, catered and convenience foods, and foods served aboard interstate conveyances for the purpose of establishing guidelines that may be applied nationally by Federal, State, and local food-control agencies.
[8 tables] FTP

0.4 (0.7)(9.6) METABOLIC ASPECTS OF FOOD SAFETY

Roe, F. J. C. (editor)
Published by Blackwell, Oxford, England (1970), xxii + 612 pp., price £7
Egan, H. (reviewer)
Chemistry and Industry No. 21, 574 (May 22, 1971)

The material in this book is based on the proceedings of the second Nuffield Foundation Food Safety Conference held in July 1969. It is useful as a source of reference material in food safety evaluation. FTP

0.35 (9.19) CHEMICAL METHYLATION OF INORGANIC MERCURY WITH METHYLCOBALAMIN, A VITAMIN B_{12} ANALOG

Imura, Nobumasa, Eiji Sukegawa, Shoe-Kung Pan, Kiyoshi Nagao, Jong-Yoon Kim, Takao Kwan, and Tyunosin Ukita (Faculty of Pharmaceutical Sciences, University of Tokyo, Hongo, Bunkyo-ku, Tokyo, Japan)
Science 172, No. 3989, 1248-1249 (June 18, 1971)

The results presented in this article show that methylmercury is easily generated from inorganic mercury in the presence of methylcobalamin.
[1 figure, 1 table, 9 references] FTP

0.2 (9.6)

The compilation contains numerous figures, tables, and internal references. A nine-item bibliography concludes the volume. LB

0.36

dietary alcohols had taken place because part of the tritium in the wax esters was in position 1 of the alcohol that had been fed.

The body lipids of the tropical fish contained a small amount of wax esters; direct esterification may play a greater role in their formation, as indicated by the higher specific activity of tritium. The glycerol moiety of the triglycerides and phosphatidylcholines contained significant amounts of tritium. Apparently, very little tritium had been used for the synthesis of lipid chains.
[7 tables, 25 references] FTP

0.35 N-NITROSAMINES NOT IDENTIFIED FROM HEAT INDUCED D-GLUCOSE/L-ALANINE REACTIONS

Scanlan, Richard A., and Leonard M. Libbey (Department of Food Science and Technology, Oregon State University, Corvallis, Ore. 97331)
Journal of Agricultural and Food Chemistry 19, No. 3, 570-571 (May-June 1971)

O. G. Devik (Acta Chem. Scand. 21, 2302 (1967)] reported that N-nitrosamines were formed from the heat induced reactions between D-glucose and several L-amino acids. Because of the potent carcinogenicity of N-nitrosamines, the present researchers examined the products of heated D-glucose/L-alanine. The two compounds were absorbed on potato starch in a slurry (pH 8.5), the slurry was heated at 100° C. for 20 hr., and then the products were vacuum distilled. The aqueous distillate was extracted with dichloromethane and the extracts were analyzed by tandem gas chromatography-mass spectrometry. The results indicate that lower molecular weight dialkylnitrosamines are not produced in heated D-glucose/L-alanine systems.
[1 table, 7 references] FTP

0.5 IMMUNOFLUORESCENCE AMONG STRAINS OF CLOSTRIDIUM BOTULINUM AND OTHER CLOSTRIDIA BY DIRECT AND INDIRECT METHODS

Lynt, R. K., Jr., H. M. Solomon, and D. A. Kautter (Division of Microbiology, FDA, Department of Health, Education and Welfare, Washington, D.C. 20204)
Journal of Food Science 36, No. 4, 594-599 (May-June 1971)

Earlier work has demonstrated limited success in the use of fluorescent antibodies (FA) for the rapid detection and identification of Clostridium botulinum. The present study explored further the use of the FA technique to detect C. botulinum. In addition, an attempt was made to determine how the relationship between proteolytic and nonproteolytic strains of the same toxigenic type would affect fluorescence of their somatic antigens and the degree of similarity among the nonproteolytic strains of types B, E, and F. The immunofluorescence among strains of C. botulinum and other clostridia using somatic antisera was examined by direct and by indirect tests.

Thrity toxigenic type E strains and all nontoxigenic variants, and all nonproteolytic type B and F strains tested, fluoresced with all type E antisera. All type E strains, and the nonproteolytic type B and F strains, fluoresced with the nonproteolytic type B and F antisera. The proteolytic strains of types A, B, and F did not fluoresce with any of these antisera, but the proteolytic strains cross-reacted as a separate group. The other clostridia (C. sporogenes, C. tetani, C. histolyticum) did not fluoresce with the nonproteolytic antisera. C. sporogenes, C. tetani, and C. histolyticum fluoresced with proteolytic antisera, but this varied with the antiserum. In indirect tests, absorbed antisera showed homologous fluorescence to be specific, and cross-reactions with strains of C. botulinum to

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0.5 (9.19) PHENYLMERCURIC ACETATE: METABOLIC CONVERSION BY MICROORGANISMS

Matsumura, Fumio, Yoshiko Gotoh, and G. Mallory Boush (Department of Entomology, University of Wisconsin, Madison, Wis. 53706)
Science 173, No. 3991, 49-51 (July 2, 1971)

The purpose of this study was to determine the metabolic fate of phenylmercuric acetate (a compound extensively used as a fungicide and slimicide) in soil and aquatic microorganisms. Further, the authors attempted to establish the significance of the action of microorganisms on the fate of mercury residues. They point out that evidence is lacking to support the hypothesis that microorganisms generally convert phenyl mercurials to methylmercury compounds.

Thirty-five isolates of microorganisms from natural lake bottom sediments were used in this study. They were isolated by the method of F. Matsumura and G. M. Boush [Science 153, 1278 (1966)].

Phenylmercuric acetate was metabolized quickly by soil and aquatic microorganisms. One of the major metabolic products was diphenylmercury. No methylmercury derivative was found among the microbial metabolic products of phenylmercuric acetate.

The authors postulate that a direct conversion of phenylmercury to methylmercury is not a common process in microorganisms (at least not under aerobic conditions). But, K. Tonomura, K. Maeda, F. Futai, T. Nakagami, and M. Yamada [Nature 217, 644 (1968)] showed that one species of microorganism can directly convert phenylmercury to metallic mercury; this process could eventually lead to the formation of methylmercury through the conversion of Hg^0 to Hg^{2+}.

[3 figures, 17 references] FTP

0.5 (2.01) INHIBITION OF PSEUDOMONAS SPECIES BY HYDROGEN PEROXIDE PRODUCING LACTOBACILLI

Price, R. J., and J. S. Lee (Department of Food Science and Technology, Oregon State University, Corvallis, Ore. 97331)
Journal of Milk and Food Technology 33, No. 1, 13-18 (January 1970)

Previous work on microbial interactions has shown that various species of Pseudomonas, Achromobacter, Proteus, Escherichia, Aerobacter, Klebsiella, Flavobacterium, Alcaligenes, Streptococcus, Lactobacillus, and Leuconostoc can inhibit Staphylococcus aureus. Further, some lactic streptococci produce the antibiotics nisin and diplococcin; certain lactobacilli produce acidophilin, lactocidin, and lactolin. In the present study, 81 species of bacteria isolated from seafoods and other marine sources were examined for possible growth interactions. Spot-plate, cross-plate, and concurrent growth tests were carried out at 7°, 15°, 20°, and 30° C. The Lactobacillus plantarum used in these experiments was isolated from the Pacific oyster.

L. plantarum produced a substance that inhibited growth of species of Pseudomonas, Bacillus, and Proteus; the inhibitory substance was most effective toward the Pseudomonas. The substance accumulated in the media in which the Lactobacillus was cultured and reached maximum concentrations in the media after 4 to 5 days incubation at 30° C. The inhibitory substance was dialyzable, heat labile, and inactivated by catalase. The authors suggest that the inhibitory reaction resulted from the H_2O_2 produced by the lactobacilli.

[4 figures, 2 tables, 37 references] FTP

0.6 (9.19) NITRATES IN PLANTS AND WATERS

Keeney, D. R. (Department of Soil Science, University of Wisconsin, Madison, Wis. 53706)
Journal of Milk and Food Technology 33, No. 10, 425-432 (October 1970)

This article is a review of available information on nitrogen sources in the environment and transformation in soils, waters, and plants, particularly as they affect the nitrate content of potable waters and foods.

[1 figure, 7 tables, 54 references] FTP

0.8 (3.33) A PROCEDURE FOR ESTIMATING STERILIZATION OF AND QUALITY FACTOR DEGRADATION IN THERMALLY PROCESSED FOODS

Jen, Y., J. E. Manson, C. R. Stumbo, and J. W. Zahradnik (Department of Food and Agricultural Engineering and Department of Food Science and Technology, University of Massachusetts, Amherst, Mass. 01002)
Journal of Food Science 36, No. 4, 692-698 (May-June 1971)

A method is presented to estimate not only the sterility but also the degradation of nutrient and quality factors in thermally processed foods.

[2 figures, 4 tables, 11 references] FTP

0.5 FATTY ACID COMPOSITION OF THERMOPHILIC, MESOPHILIC, AND PSYCHROPHILIC CLOSTRIDIA

Chan, May, Richard H. Himes, and J. M. Akagi (Departments of Microbiology and Biochemistry, University of Kansas, Lawrence, Kan. 66044)
Journal of Bacteriology 106, No. 3, 876-881 (June 1971)

The data reported in this article are part of a program for studying the cellular components of thermophilic anaerobes and deal with the fatty-acid distribution pattern of two thermophilic anaerobes. For comparative purposes, data are also reported in the fatty-acid composition of a mesophilic and a psychrophilic anaerobe. The organisms used in the study were Clostridium thermosaccharolyticum, C. tartarivorum, C. pasteurianum, and Clostridium sp. strain 69.

The thermophiles contained higher levels of saturated straight- and branched-chain fatty acids than did the other organisms; of the branched-chain fatty acids, iso C_{15} was the predominant type. The mesophile and the psychrophile had a higher content of unsaturated fatty acids than did the thermophiles. Further, the authors report for the first time the discovery of an unsaturated cyclopropane fatty acid (12,13-methylene-9-tetradecenoic acid) in anaerobes.

Apparently the organisms grown at higher temperatures contained a higher percentage of saturated fatty acids with comparatively higher melting points. The predominance of cyclopropane and monoenoic fatty acids in C. pasteurianum is indicative of this organism's requirement for a lower temperature for optimum growth.
[3 figures, 3 tables, 21 references] FTP

0.8 THESAURUS OF ENGINEERING AND SCIENTIFIC TERMS
(9.6)

Anonymous
Engineers Joint Council (345 E. 47th St., New York, N.Y. 10017), 690 pp., $25 bound, $19.50 flexible

After 2½ year's work, the Office of Naval Research and the Engineers Joint Council (assisted by some 300 individual engineers, scientists, and lexicographers with a computer) have issued, for the Department of Defense, this 18,000-descriptor thesaurus. It is divided into four sections, four columns to the page: (1) Thesaurus of Terms (an alphabetical listing of descriptors and use terms--about 430 pages), (2) Permuted Index (an alphabetical listing of significant terms, with the proper word order indicated for multiword terms--about 130 pages), (3) Subject Category Index (subjects listed under 22 major and 178 lesser category heads--about 60 pages), and (4) Hierarchial Index (a list of complete families of descriptors--about 50 pages). Also listed are the panelists and the four contract services who worked on the vocabulary. LB

0.8 HANDBOOK OF TABLES FOR APPLIED ENGINEERING SCIENCE
(3.20)(9.6)

Bolz, Ray E., and George L. Tuve (editors)
Published by The Chemical Rubber Co., Cleveland, Ohio (1970), 975 pp., Price $26.50
ASHRAE Journal 13, No. 6, 92 (June 1971)

This book contains a compilation of tables covering a broad range of engineering fields. The section on Environmental and Bioengineering contains tables and information on (1) Atmosphere, Earth, Ocean, (2) Pollution & Its Control, (3) Indoor Space Conditioning, (4) Sound & Acoustics, and (5) Human Factors & Safety.
FTP

0.5

be due to common antigens. Proteolytic antisera absorbed with C. sporogenes showed little or no loss of fluorescence for C. botulinum; however, fluorescence with C. sporogenes was removed. Blocking tests of conjugates of these antisera showed similar results. The direct test seems better adapted to screening for C. botulinum in foods and environmental samples.
[7 tables, 33 references] FTP

0.7 MODELS FOR CONTROL OF THE NUTRITIVE CONTENT OF MENUS PLANNED BY COMPUTER

Eckstein, Eleanor F. (Department of Nutritional Sciences, University of California, Berkeley, Calif. 94720)
Food Technology 25, No. 6, 36-37, 40 (June 1971)

The author examines four models for controlling the nutritive content of menus planned by computer in terms of expected cumulative and aggregate nutritional effects. These four alternative models were (1) Random or uncontrolled (Menus are planned without nutritional constraints.), (2) Maximum control (Menus are planned for maximal control of nutritive content.), (3) Linear programming (Menus are planned at least cost.), and (4) Moving average control (Menus are planned so that the arithmetic average for nutrient X is constrained to approximate the Recommended Dietary Allowance for the appropriate reference group.). Model 1 is unacceptable: it affords no control, and cumulative and aggregate nutritional effects are unpredictable. Model 2 is unrealistic: it assumes a high level of control which is not attainable in institutional feeding units. Model 3 is valid but tends to drive down acceptibility. Model 4 offers the best alternative because it maintains the balance of nutrients inherent in the Recommended Dietary Allowance, the expected cumulative and aggregate nutritional effects are adequate.
[2 figures, 10 references] FTP

0.6 ALGAE, BACTERIA, AND YEASTS AS FOOD OR FEED

Lipinsky, Edward S., and John H. Litchfield (Battelle Memorial Institute, Columbus Laboratories, Columbus, Ohio)
CRC Critical Reviews in Food Technology 1, No. 4, 581-618 (December 1970)

The use of algae, bacteria, and yeasts as food for man and beast has been discussed fairly thoroughly of late in both the scientific literature and the popular press. This coverage can be attributed to interest in supplying the need for additional food in chronically food-short areas of the world and for life-support of astronauts on extended space flights. Therefore the reviewers direct their attention here to the most recent literature. They attempt to analyze the current status of the use of these microorganisms for food and to project their possible application in the future.
[3 figures, 14 tables, 135 references] LB

0.8 HARD CLAM CLEANSING IN NEW YORK
(2.3)(1.82)
(9.19)

MacMillan, Robert B., and James H. Redman (New York State Department of Environmental Conservation, Division of Marine and Coastal Resources, Ronkonkoma, N.Y. 11779)
Commercial Fisheries Review 33, No. 5, 25-33 (May 1971)

The State of New York has approximately 400,000 acres of underwater marine lands suitable for the cultivation of shellfish. Thirteen percent of this area is closed to the harvesting and marketing of shellfish due to microbial pollution. Many of these areas support abundant populations of hard clams (Mercenaria mercenaria). These shellfish constitute a natural resource which if not being utilized and a public health menace if harvested and marketed illegally.

A program to evaluate the feasibility of depurating hard clams, utilizing a pilot-plant operation, has been completed by the State of New York.

The term "depuration," as related to shellfish and the shellfish industry, involves a process whereby shellfish harvested from certain restricted areas are placed in a controlled environment for a specified period of time in order to remove any bacterial or viral contamination that may be present. These shellfish may then be placed on the market for human consumption.

Hard clams were harvested by commercial methods from closed growing areas and subjected to a 48-hour process using sea water obtained from a well system. Shellfish samples were analyzed at 0, 24, and 48 hours to evaluate the effectiveness of the depuration process.

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0.9 NEW DIMENSIONS OF U.S. MARINE POLICY
(9.6)(9.3)
(1.011)

Padelford, Norman J., and Jerry E. Cook (Sea Grant Project Office, Massachusetts Institute of Technology, Cambridge, Mass. 02139)
Sea Grant Project GH-88, Report No. MITSG 71-5, xi + 250 pp. (April 1971)

This volume is a sequel to the senior author's "Public Policy for the Sea" (1970), in which he attempted to identify the principal features of U.S. ocean policy and to categorize some of the fundamental policies relative to and agreements with other countries. Basically it is a collection of source material, with one exception issued either in 1969 or 1970, that has been grouped into seven chapters: "New Goals for Marine Policy," "The Coastal Zone and Continental Shelf," "Marine Utilization," "Pollution of the Sea," "The International Seabed Area," "Organizing the National Oceanic Administration," and "Looking to the Future." Each chapter begins with a 3- to 10-page introductory note written by the authors and ends with a list of suggested references for further reading.

The authors give as their reason for working within the chronological limits noted above the extraordinary combination of policy actions taken since 1969, actions that have clearly added new dimensions to U.S. marine policy. Their objects in collecting the materials stating these policies were (1) to help their readers (a) comprehend the trends in contemporary ocean policy and (b) understand the processes by which broad concepts and goals are translated into specific policy action and (2) to stimulate interaction between those scientists and engineers who are directly concerned with the marine environment and those policy makers

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1.011 A CENTURY OF FISHERIES IN NORTH AMERICA
(9.6)

Benson, Norman G. (editor)
Special Publication No. 7, American Fisheries Society, Washington, D.C. (1970); ix + 330 pp. $10.
Henry A. Regier (Department of Zoology, University of Toronto, Toronto, Canada) (reviewer)
Transactions of the American Fisheries Society 100, No. 3, 592-593 (July 1971)

For this book, 20 authors have written chapters synopsizing the history of the American Fisheries Society from 1870 to 1920 and from 1920 to 1970; describing trends in research, education, and fish culture; dealing with fresh-water fisheries--southeastern pond culture, the Great Lakes, northern glacial lakes, western mountain lakes, central warm-water streams, northeastern trout streams, and central and southwestern reservoirs; reviewing the marine fisheries--those for Pacific sardine, herring, Pacific halibut, Pacific salmon, Pacific tuna, Atlantic groundfish, and shellfish; reporting on the status of the society at its centennial; and looking at the future of sport fisheries management. The book has 12 appendices.

[The reviewer concludes, just from the weight of evidence, that "North America" as it is used in this book actually means "United States."] LB

1.0119 FIVE FLEETS SUPPLY FISH TO CUBA
(2.11)

Young, Edgar P.
Fishing News International 10, No. 5, 22-24, 26, 29 (May 1971)

At the head of the Cuban fishing industry is The National Institute of Fishery, with departments responsible for the purchase and import of fishing vessels and equipment and for the export and sale of fish and marine products. It operates nine research vessels from its Fishery Research Center in Havana as well as special establishments, under the aegis of FAO experts of various nationalities, for the study and breeding of oysters, sponges, shrimps, bullfrogs, and fresh-water fish and crustaceans. It has established a large cannery, supplied by Bulgaria, in Pinar del Rio, and administers training schools that are supplementary to those provided by the Soviet Union and by East Germany. It exercises general control over the inshore and near-water fleets and complete control over the distant-water fleet.

The principal features of Cuba's five fishing fleets are as follows.

The Caribbean Shrimping Fleet - based in Havana and operating in the Gulf of Mexico and the Caribbean; composed of four flotillas comprising about 400 trawlers, 90 built in Spain and 30 built in France, most of which are refrigerated and equipped to process the catch at sea; manned by from 11 to 14 men whose work schedule is 60 days at sea and 15 days of rest; fishes for shrimp.

Southern Shrimping Fleet - based at Manzanillo and Cienfuegos; composed of 113 vessels and supported by a shipyard at Cienfuegos and an ice plant at Manzanillo, the distribution point to inland towns and villages; the 37 shrimping boats manned by 465 men, the 76 fishing boats by 246.

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1.0117 (1.9)(9.6)

THE BIOLOGY OF THE SPOT, LEIOSTOMUS XANTHURUS LACÉPÈDE, AND ATLANTIC CROAKER, MICROPOGON UNDULATUS (LINNAEUS), IN TWO GULF OF MEXICO NURSERY AREAS

Parker, Jack Clark (Agricultural Extension Service, Texas A&M University, College Station, Tex.)
Sea Grant Publication No. TAMU-SG-71-210, xi + 182 pp. (May 1971)

The distribution of spot and Atlantic Croaker in the vicinity of Lake Borgne, Louisiana and Galveston Bay, Texas was determined in relation to temperature, salinity, and certain hydrographic features. Geographic variations in spawning, growth rates, distribution and food habits were evaluated. Length-weight relationships were compared between the two areas, and in Galveston Bay, condition of fish was studied in relation to size of fish, habitat, season, temperature, and salinity. [32 figures, 32 tables, 69 references] Author's abstract reprinted in part FTP

1.01 (0.6)

TRENDS IN WORLD AND DOMESTIC FISHERIES

Johnson, James H. (National Marine Fisheries Service Environmental and Fishery Forecasting Unit, Monterey, Calif. 93940)
United States Naval Institute Proceedings 97, No. 6/820, 25-35 (June 1971)

Properly managed, the sea can provide a substantial part of the world's protein needs for some time to come. Two programs now underway in the United States should be expanded: (1) we must use the available scientific talent to expand our efforts in the management of world fishery resources and (2) we should accelerate our efforts to develop fishery products suitable for feeding the world's hungry and explore new approaches in the distribution of these products. [5 illustrations, 6 figures, 1 table] FTP

0.8 (9.19)

A PLAN FOR REDUCING THERMAL POLLUTION FROM POWER PLANTS

Tsongas, George A. (Aerospace Research Laboratory, University of Washington, Seattle, Wash. 98105)
The Trend in Engineering 23, No. 2, 20-29 (April 1971) (Office of Engineering Research, University of Washington, Seattle, Wash.)

The author examines the problem of thermal pollution from power-generating plants. He suggests a new means of reducing such pollution by radiating the heat away to outer space with little or no atmospheric absorption. [4 figures, 32 references] FTP

0.9 (9.6)(9.3)(1.011)

who operate in the political arena. Only if the people who make decisions at the political level and the people who frame the laws and regulations to carry out these decisions know the views of enlightened scientists and engineers can the common interests of the scientific community and the nation be advanced.

The authors suggest that readers of this volume can think through pragmatically the questions that must be resolved as events unfold and decisions are reached if they follow some such process as -

1. Consider the nature of the problem at hand, assembling the pertinent facts necessary to clarify its nature.
2. Inquire into the nature and identity of national goals and objectives.
3. Ascertain what the national interest requires with respect to the situation, identifying possible alternatives and weighing the advantages and disadvantages of each.
4. Come to a conclusion about what action should be taken by considering alternatives that are practicable, realizable, and politic. [17 figures, 27 references] LB

FTP

[155 footnotes]

raised by weather modification efforts.

In this article, the author examined selected legal and policy questions

Boston College Industrial and Commercial Law Review 12, No. 4, 503-540 (March 1971)

Firenzen, Donald E. (National Aeronautics and Space Administration, Washington, D.C.)

0.9 WEATHER MODIFICATION: LAW AND POLICY

0.8 (2.3)(1.82)(9.19)

An analysis of the data indicates that the depuration process may be used to cleanse hard clams taken from restricted waters. As a result, New York will authorize use of this process by private concerns. Specific growing area locations and plant designs will be considered and reviewed on an individual basis. New York will also provide laboratory support to ensure proper operation of the plant. [6 figures, 2 tables, 3 references] Extracted

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1.0119 (2.11)

Gulf Fleet - based in Havana and operating in the Gulf of Mexico; composed of Cuban-built motor ships of three types (Lambda, Sondero, and Golfo) plus a few pre-Revolutionary sailing vessels; manned by 8 to 20 men, depending on the type vessel, mostly aged 16 to 25; one Lambda and one Sondero operated as a unit, two or three units to a flotilla, with one Sondero serving as transport for all the other vessels in the flotilla; fishes for snapper, red snapper, and similar fishes using Creole longlines from motorized dories and for sardines using electric lights and dragnets.

Cuban Fishing Fleet - based at a Soviet-built yard in Havana and a subsidiary base at Las Palmas, in the Canary Islands; operates down the West Coast of Africa and in the Gulf of Acapulco; composed of 12 Spanish- and East German-built stern trawlers ranging in size from 1,879 to 5,850 tons, 6 Soviet-built side trawlers of 1,870 tons, 25 or 30 Spanish-, Japanese-, and Soviet-built tuna vessels, 4 Spanish-built cod-fishing vessels equipped for processing fresh and salted fish and for making fishmeal, 2 Italian-built refrigerated transport and supply ships and an expassenger liner converted to the same purpose, and 1 Cuban-built steel tender, plus 9 East German-built fishmeal cutters; manned primarily by Cuban crews, but with a few Japanese and considerable numbers of Soviet technicians on board; fishing tour from 3 to 8 months at sea with 45 days leave after each 6 months' sea duty; fishes for tuna, cod, and other fish.

Platform Fleet - based at Batabano and operating along the Continental Shelf around the Cuban islands; composed of 107 vessels organized into two flotillas, one consisting of 67 lobster catchers and one of 33 vessels for catching fish and seven 60-ft. cutters with 4 dories each for harvesting sponges; fishes for rock and spiny lobster using strings of steel-wire traps, for shrimp, for sardines, and for sponges using hooks and dories. [8 photographs] LB

1.4 (1.0113) REPRODUCTIVE PATTERNS OF PACIFIC OCEAN PERCH (SEBASTODES ALUTUS) OFF WASHINGTON AND BRITISH COLUMBIA AND THEIR RELATION TO BATHYMETRIC DISTRIBUTION AND SEASONAL ABUNDANCE

Gunderson, Donald R. (Washington State Department of Fisheries, Fisheries Center, University of Washington, Seattle, Wash. 98105)
Journal of the Fisheries Research Board of Canada 28, No. 3, 417-425 (March 1971)

In the northeast Pacific area the migration of Pacific ocean perch seems to be related to the stages involved in the reproduction of the species. This paper reports on the migration pattern of Pacific ocean perch off the Washington-Vancouver Island area and correlates this migration pattern with the reproductive cycle of Sebastodes alutus in this area. Catch data of the Washington commercial trawl fleet were used to establish the migration pattern of the fish. The S. alutus is an ovoviviparous species.

Females of S. alutus in the Washington-Vancouver Island area release their larvae in March. Mating probably takes place during September or October. Mating occurs while the Pacific ocean perch move to deep water from the shallow water regions inhabited in the summer, and the females release their larvae while in the deepest part of their bathymetric range.

In the deepwater fishing regions, a maximum catch was associated with the March spawning period. In all regions, there was a midsummer slump in catch and catch rate; in October another maximum catch occurred, apparently during the mating period.

[4 figures, 4 tables, 14 references] FTP

2.116 HOW TO INSTAL [INSTALL] AN ECHO SOUNDER IN IN A SMALL FIBERGLASS BOAT

Lusz, Larry D. (Exploratory Fishing and Gear Research Base, NOAA, National Marine Fisheries Service, 2725 Montlake Blvd. E., Seattle, Wash. 98102)
Commercial Fisheries Review 33, No. 5, 44-47 (May 1971)

Ordinarily, the transducer of an echo sounder system is mounted on the exterior hull of a vessel. Such installation creates no serious technical problems on large boats. But, on small boats, the exterior-mounted transducer may adversely affect the performance of the hull and further it may be vulnerable to damage when the boat is operated in shallow water or when it is placed on a trailer. This article describes how to install the transducer of an echo sounder inside the hull of a fiberglass boat and gives some data on the performance of the transducer when mounted in such position.

The fiberglass boat in which the echo sounder was installed was 23 feet 9 inches long at the center line and was 8 feet at the beam. It had an inboard/outboard drive unit with a 20-hp. engine. The hull was reinforced fiberglass plastic and the structural members of the boat were wood. The echo sounder operated at a frequency of 105 kHz and had a maximum range of 200 fathoms.

A diagram of the well for installing the transducer inside the boat hull is shown in the figure on back of card. The readout and transmitter/receiver were mounted on the port bulkhead in the cabin of the boat.

The results showed that the transducer of an echo sounder could be mounted inside the hull of a fiberglass boat without a reduction in sensitivity (as compared to echo sounder with transducer mounted outside the boat).

[2 figures] (over)

2.05 (0.5) INCIDENCE AND IDENTIFICATION OF SOME BETA-HEMOLYTIC STREPTOCOCCI IN FOODS

Lee, Iris, and John A. Koburger (Department of Plant Pathology and Bacteriology, West Virginia University, Morgantown, W. Va.)
Journal of Milk and Food Technology 33, No. 8, 323-325 (August 1970)

One hundred and nine food products were examined for the incidence of beta-hemolytic streptococci (using a pre-enrichment--Most Probable Number technique). The commercial food samples consisted of meat (ground beef, chicken, lamb stew, sausage, chicken liver, lamb patties, boneless beef stew), fish (smelt, whiting), vegetables, dehydrated foods, dairy products, and miscellaneous items (pie, tea, cake roll). Eighty-seven isolates of beta-hemolytic streptococci were obtained from 18 of the meat and fish samples; none were obtained from the vegetables, dairy products, dehydrated foods, and miscellaneous food items. All foods that were positive for beta-hemolytic streptococci were of the type that required further cooking for consumption.

[2 tables, 17 references] FTP

2.12 (9.6) SOVIET BOOK ON FISH SCOUTING

Burgess, John (reviewer)
Exploratory Fishing and Scouting
Yudovich, Yu. B., and A. A. Baral
Fishing News International 10, No. 5, 77-78 (May 1971)

In June of 1970, the reviewer described methods advocated by a fisheries scientist for exploring potential new fishing grounds. The procedure suggested involved a systematic survey by echo sounder and then a sampling with various types of lines and nets. In other words, it was elementary exploratory fishing.

Those who are interested in more information on the subject will find it in "Exploratory Fishing and Scouting." The original Russian has been translated by H. Mills and M. Ben-Yami, and the English version has been published for the Translations Program of the U.S. National Marine Fisheries Service and for the National Science Foundation under the Israel Program for Scientific Translations. It is available from the U.S. Department of Commerce, National Technical Information Service, Operations Division, Springfield, Va. 22151. The reviewer says that it explains in detail how exploratory fishing should be done--leaving no aspect of the subject untouched, no commercial species of fish unmentioned, and no ocean area untapped. He considers it the most valuable work of its kind available from any source. LB

2.3 (8.8) SOME OBSERVATIONS ON THE QUALITY OF THE WEATHERVANE SCALLOP (PLATINOPECTEN CAURINUS)

Groninger, H. S., and K. R. Brandt (Bureau of Commercial Fisheries, Technological Laboratory, Seattle, Wash. 98102)
Journal of Milk and Food Technology 33, No. 6, 232-236 (June 1970)

The weathervane scallop was first harvested in Alaskan waters in 1968. Commercially, the scallop meats are iced aboard vessel; they are transferred to a freezing plant ashore and are then frozen. Examination of some scallop meats prepared in this manner revealed some samples that showed an excessive amount of drip on thawing and were more tough in texture than normal. The object of the present study was to determine the major chemical and physical changes that take place when the weathervane scallop meats are stored at 32° F. and to suggest methods to control the undesirable changes that may take place. pH, salt solubility, and content of adenine nucleotides, phosphorylated sugars, and glycogen were determined on the scallop meats periodically during storage to help define the changes that take place. The triangle test was made to detect any changes in flavor of the meats.

When the scallop meats were stored for 10 days (32° F.), they showed little or no undesirable change in flavor of the cooked meats but the texture was tough. Treating the raw meats with tripolyphosphate did reduce the degree of toughness of the stored meats, but not enough to justify its use.

The authors suggested that the fresh scallop meats be frozen soon after the shellfish are landed and shucked, possibly aboard ship, in order to obtain a superior frozen product.
[5 tables, 10 references] FTP

2.12 (2.1473) LINE-FISHING ON THE CONTINENTAL SLOPE III. MID-WATER FISHING WITH VERTICAL LINES

Forster, G. R. (The Plymouth Laboratory)
Journal of the Marine Biological Association of the United Kingdom 51, No. 1, 73-77 (February 1971)

For the past several years, the author has conducted fishing trials on the continental slope off southwest England. The results showed that significant catches could be made down to 3,000-m. depths at several positions; but when hooks were lifted off the bottom, either by accident or design, very few fish were taken. Although these results seemed to indicate that the chances of catching bathypelagic fish in midwater by baited hooks would be slim, the black scabbard fish (Aphanopus carbo) and two species of deep-water squaloids (Centrophorus squamosus Bonnaterre and Etmopterus princeps (Collet)) were taken regularly on free-drifting vertical lines set in deep water.

Early in the experiments, the author found that thin white lines would be bitten through, always at about the 1,100-m. depth. Black scabbard fish were taken at this depth with baited hooks on thin wire line in 1967. So a clip-on paternoster (boom) was made from a nylon laminate and two longline snoods and rigged with 16-in. wire traces bearing either a swivel conger hook or a No. 3/0 beak hook and separate swivel. This gear proved satisfactory. Other details of the line and the catches are given in two tables.
[1 figure, 2 tables, 14 references] LB

1.85 (1.0162) [STUDY OF THE RHYTHM OF NOCTURNAL ACTIVITY OF PENAEUS INDICUS AND PARAPENAEOPSIS ACCLIVIROSTRIS (CRUSTACEA DECAPODA NATANTIA)] CONTRIBUTION À L'ÉTUDE DU RYTHME D'ACTIVITÉ NOCTURNE DE PENAEUS INDICUS ET PARAPENAEOPSIS ACCLIVIROSTRIS (CRUSTACEA DECAPODA NATANTIA)

Le Reste, L. (Centre O.R.S.T.O.M. de Nosy-Bé, B.P. 68, Madagascar)
Cahiers O.R.S.T.O.M. Série Océanographie 8, No. 3, 3-10 (1970) (In French; English abstract)

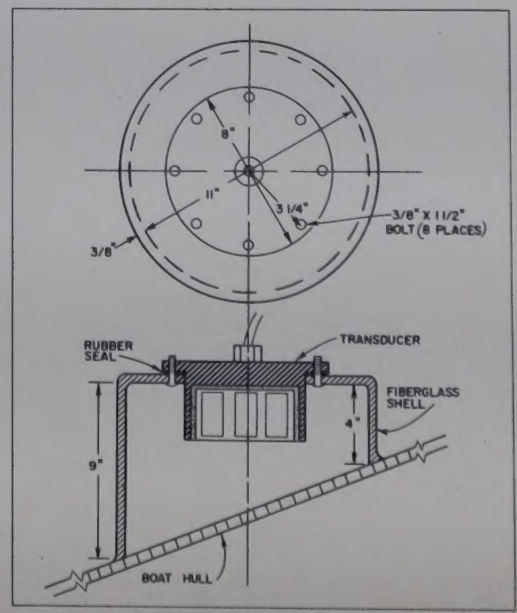
Variations in the night catch of the subject shrimp, caught along the northwest coast of Madagascar, were analyzed. For P. indicus, catches were greatest between 1800 and 2300; for P. acclivirostris, between 1900 and 2300. Around midnight catches for both species were minimum. A second less important maximum occurred toward morning--between 500 and 600 for P. indicus and between 400 and 500 for P. acclivirostris. Thereafter catches declined again.
[4 figures, 3 tables, 19 references] LB

1.89 A RANGE EXTENSION FOR THE SQUID ABRALIOPSIS (WATASENIA) FELIS

Macaskie, I. B. (Fisheries Research Board of Canada, Arctic Biological Station, Ste. Anne de Bellevue, Quebec, Canada)
Journal of the Fisheries Research Board of Canada 28, No. 4, 620-621 (April 1971)

Four specimens of the squid were collected by net at 48°06' N. 126°10'W. in July 1968. This finding extends the range of the species 300 miles northward of the previously reported discovery of the species near 43°00'.
[2 figures, 2 references] FTP

2.116



Well design for installing transducer inside boat hull.

FTP

2.12 (2.1126)(1.013) LA PESCA EXPERIMENTAL CON FILETE DE AHORQUE EN EL GOLFO DE PARIA [EXPERIMENTAL FISHING WITH GILLNETS IN THE GULF OF PARIA]

Mihara, T., A. Brito, J. Ramírez, and J. V. Salazar
Informe Técnico No. 23, 15 pp. (1971) (In Spanish; English summary)

The comparative effectiveness of gill nets made of braided nylon thread and of gill nets made of nylon monofilament for catching king and Spanish mackerel (Scomberomerus caballa and S. maculatus) was tested by experimental fishing trials in the Gulf of Paria. The characteristics of each net--its tensile and elongation resistence, reduction (the relation between the length of the headrope along which the mesh is hung and the length of the stretched mesh, in percent), buoyancy, flexibility, bulk, selectivity, and visibility, as well as the price of the materials from which each was made--are given in detail. The authors recommend that mackerel gill nets be made of nylon monofilament (either No. 10, 2200 denier or No. 12, 2640 denier), be tied in double English knots, and be 150 meshes high; have 4- or 4½-in. meshes (stretched), a color similar to that of the water, a positive buoyancy of 450 g./m., and a reduction percentage of 45 or 50.
[5 figures, 7 tables] LB

2.9 (0.4)(0.7) THE PROBLEM OF FORMATION OF NITROSAMINES BY REACTING MONOSACCHARIDES WITH AMINOACIDS (MAILLARD-REACTION)

Heyns, Kurt, and Helmut Koch (Institut für Organische Chemie und Biochemie der Universität Hamburg, D-2000 Hamburg 13, Papendamm, Germany)
Zeitschrift für Lebensmittel-Untersuchung und -Forschung 145, No. 2, 76-84 (February 1971)

The authors applied gas chromatography and mass spectrometry, polarography and thin-layer chromatography, to the study of the volatile reaction of various glucose-amino-acid mixtures in an attempt to determine the formation of nitrosamines under Maillard-reaction conditions. They concluded that the appearance of nitrosamines could be excluded under the conditions of the tests.
[3 figures, 6 tables, 26 references] FTP

2.43 (3.2382) EDIBLE PACKAGING UPDATE

Morgan, Bruce H. (Research and Engineering/Lamb-Weston, Inc., Portland, Ore.)
Food Product Development 5, No. 4, 75-77, 108 (June-July 1971)

The author defines, arbitrarily, an edible package as: "A material that can completely enrobe, or otherwise completely contain, a food so as to provide to it a barrier to oxygen, moisture (and also, preferably, carbon dioxide and nitrogen), and be resistant to oils and grease at temperature and humidity ranges found normally in the storage and distribution cycle. The edible package also can be eaten by the consumer after it has been dissolved in the moisture used for the foods' table preparation." An edible package might, however, possess other characteristics, such as (1) be nonsticky, (2) enhance the appearance of the food, (3) retain and enhance color of the food, (4) retain volatile flavors of the food, (5) extend shelf life of the food, and (6) reinforce the structure of the food.

The author briefly discusses the characteristics, properties, and uses of various edible packaging materials under the following groupings: (1) Modified waxes, (2) Cellulose based products, (3) Starch, dextrin and amylose-based materials, (4) Acetylated glycerides, (5) Collagen derivatives, (6) Alginates and pectin, and (7) Miscellaneous systems.

A guide to sources of 10 commercial edible packaging materials is listed. A reference to one patent is included--U.S. Patent 3,323,922, The Pillsbury Co., Minneapolis, Minn.; also, reference is made to the Report of Archer Daniels Midland Co., AD-633-044 Contract DA 19-129-AMC-102(N), two parts, to Natick Laboratories, U.S. Army Laboratories, Natick, Mass. FTP

3.0 (9.6) THE ALMANAC OF THE CANNING, FREEZING, PRESERVING INDUSTRIES

Anonymous
Annual Edition 1971 (56th Edition), over 546 pp. (July 1971) Price $10.00
Published by Edward E. Judge & Sons, P.O. Box 866, Westminster, Md. 21157)

According to the publisher's brochure, the Almanac provides quick, reliable reference to basic facts of the food industry. It is organized into 11 sections as follows: (1) Personnel, Addresses, Telephone Numbers; (2) Food Law and Regulations; (3) Labeling and Packaging; (4) FDA Standards of Identity, Quality, Fill; (5) Quality Grade Standards; (6) Raw Products; (7) Pack Statistics, U.S.; (8) Canned Food Prices; (9) International Trade and World Packs; (10) Appendix; and (11) Buyers Guide, Machinery, Supplies, Services. FTP

3.12 EFFECT OF THE NITROFURAN--FURYLFURAMIDE--ON CRAB MEAT QUALITY

Waters, Melvin E. (Bureau of Commercial Fisheries, Technological Laboratory, U.S. Department of the Interior, Pascagoula, Miss. 39567)
Journal of Milk and Food Technology 33, No. 8, 319-322 (August 1970)

Furylfuramide treatment of fresh-picked crab meat inhibited the growth of aerobic bacteria native to the crab meat and helped extend the shelf life from 2 to 4 days. The most effective treatment consisted of dipping the crab meat in a 5-p.p.m. solution of furylfuramide for 5 min.
[2 figures, 10 references] FTP

2.43 (2.00) MOISTURE CONTENT AND SHELFLIFE. PART 1.

Heiss, R., and K. Eichner (Institut für Lebensmitteltechnologie und Verpackung E.V., Munich, Germany)
Food Manufacture 46, No. 5, 53-56, 65 (May 1971)

In this article, the authors discuss the influence of relative humidity and of moisture content of a food on the microbiological and chemical spoilage of foods having low moisture content. An understanding of these relationships helps in the selection of packaging appropriate for the shelf life of the specific food. In this part 1, the authors define the various terms involved and then discuss the relation between critical moisture content and spoilage caused by microorganisms, enzymes, and the Maillard reaction (nonenzymatic browning). Part 2 will include a discussion of autoxidation and it will appear in the next issue of the journal.
[4 figures, 7 references] FTP

2.3 SCALLOP PROCESSING

Willis, E. D., Willis Bros. Inc. (pat.)
U.S. Patent 3,562,855
Food Technology 25, No. 6, 62 (June 1971)

The scallops are heat shocked, then agitated mechanically to remove the muscle and viscera from the shell. The muscle is separated from the viscera by means of rotating rollers. FTP

3.12 EFFECT OF NITROFURAN AND CHLORTETRACYCLINE ON THE MICROBIAL POPULATION OF SHRIMP

Waters, Melvin E. (Bureau of Commercial Fisheries, Technological Laboratory, U.S. Department of the Interior, Pascagoula, Miss. 39567), and M. K. Hamdy (Department of Food Science, University of Georgia, Athens, Ga. 30601)
Journal of Milk and Food Technology 33, No. 6, 221-226 (June 1970)

Chlortetracycline (CTC), 2-(2-furyl)-3-(5-nitro-2-furyl) acrylamide (AF-2), and 5-nitro-2-furfural acrylic acid amide (Z) were tested individually and in combination for their capacity to extend the storage life of iced shrimp. Microbiological tests made on the samples consisted of counts of aerobic, anaerobic, proteolytic, and lipolytic bacteria. Objective tests included trimethylamine nitrogen (TMAN), indole, pH, and picric acid turbidity. The organoleptic scores (based on odor and appearance) were made by an experienced panel of judges.

Nitrofuran AF-2 inhibited growth of aerobic bacteria but was less effective against anaerobic bacteria. It was slightly effective in inhibiting growth of lipolytic and proteolytic bacteria.

Nitrofuran Z showed no significant effect on the bacteria of the iced shrimp. Both compounds extended the storage life of the iced shrimp as judged by the organoleptic tests, alone.

Nitrofuran Z in combination with CTC did not appreciably inhibit microbial growth in iced shrimp. Nitrofuran AF-2 combined with CTC effectively extended the shelf life of iced shrimp as judged by the bacterial counts and objective tests.

The TMA and indole tests seemed to be suitable aids in the objective measurement of quality of the iced shrimp.
[4 figures, 2 tables, 18 references] FTP

2.12 (1.013) CRUCEROS DE PESCA EXPLORATORIA DEL ARRASTERERO "CARMELINA" EN LA ZONA OCCIDENTAL DE VENEZUELA
[EXPLORATORY FISHING WITH THE TRAWLER CARMELINA IN WESTERN VENEZUELA]

Ewald, J. J., W. Brandhorst, F. H. Durant, V. de Espinosa, and W. Diaz V.
Informe Técnico No. 25, 58 pp. (1971) (In Spanish; English summary)

Six exploratory cruises in the Gulf of Venezuela and Lake Maracaibo revealed 112 species of fish and 10 species of shrimp. At most of the 177 stations surveyed, noncommercial species were more abundant than commercial species. Distribution and biological data, along with catch rates, are given for the commercial species. [15 figures, 15 tables, 11 references] LB

2.3 FISH PRODUCTS

Amori Prefecture (pat.)
Japanese Patent 37821/70
Food Technology 25, No. 6, 64 (June 1971)

Tsukadani, a Japanese food, is prepared from fresh fish and shellfish by a process that includes steeping the meat in an aqueous seasoning composition that removes moisture from the meat. FTP

2.9 (0.4)(0.7) CONDITIONS AND CHEMICAL REACTION MECHANISMS BY WHICH NITROSAMINES MAY BE FORMED IN BIOLOGICAL PRODUCTS WITH REFERENCE TO THEIR POSSIBLE OCCURRENCE IN FOOD PRODUCTS

Ender, F., and L. Čeh (Department of Biochemistry, Veterinary College of Norway, Postboks 8146, Oslo dep. Oslo 1, Norway)
Zeitschrift für Lebensmittel-Untersuchung und -Forschung 145, No. 3, 133-142 (March 1971)

Volatile nitrosamines form when nitrite and alkylamines are present in the same media. Heterocyclic amines (such as pyrrolidine and piperidine) also form nitrosamines. Certain amino acids, and proteins from meat or fish (when nitrite is present in sufficient quantities and high temperature treatment is used), serve as precursor substances leading to nitrosamine formation. The article further describes studies on the amount and type of nitrosamines formed under various experimental conditions. The toxicity of these nitrosamines (in cases where large amounts were formed) was demonstrated using mink as the test animal.
[7 tables, 17 references] FTP

2.3 FISH FLAVOR IMPROVEMENT

Toyo Seikan Kabushikigaisha (pat.)
Japanese Patent 37823/70
Food Technology 25, No. 6, 64 (June 1971)

The flavor of marine products is improved by a process in which the products are exposed to direct electric current to remove certain electrolytes. FTP

3.15 IRRADIATION OF PACIFIC COAST FISH AT SEA

Teeny, F. M., and D. Miyauchi (Bureau of Commercial Fisheries, Technological Laboratory, Seattle, Wash. 98102)
Journal of Milk and Food Technology 33, No. 8, 330-334 (August 1970)

An experimental irradiator was installed aboard a research vessel and was used to treat west coast fish at sea. This paper describes (1) the installation of the irradiator aboard the research vessel and its calibration, (2) development of the optimum irradiation dose range for treating the fish, and (3) determination of the effect of holding the fresh fish for specific periods before irradiating them on their postirradiation storage characteristics.

The optimum irradiation dose for English sole, Dover sole, Pacific cod, Pacific ocean perch, and black rockfish was from 50 to 100 kilorads. The shelf life of these irradiation-treated fish was from 1 to 1½ times that of untreated fish. Fish irradiated before they entered the rigor stage had better storage characteristics than those fish irradiated postrigor.

[2 figures, 3 tables, 6 references] FTP

(F.M.M.)

The points for and against radiopreservation of food products are discussed.

Anonymous
Food Cosmet. Toxicol. 7, 171-174 (March 1969)
Nuclear Science Abstracts 25, No. 11, 2430 (June 15, 1971)

3.15 FOOD IRRADIATION: A COMPLEX CONUNDRUM

3.4 (3.8) HOME SMOKING AND PICKLING OF FISH

Bradley, Robert L., Charlotte M. Dunn, Mary E. Mennes, and David A. Stuiber (Department of Food Science, College of Agricultural and Life Sciences, The University of Wisconsin, Madison, Wis. 53706)
Sea Grant Program Report No. WIS-SG-71-110, 14 pp. (1971)

An introductory note cautions the fisherman about the proper treatment of his catch to prevent spoilage before smoking or pickling is begun. Then the authors describe the construction of two types of home smoker (metal drum and wooden barrel), the preparatory cleaning and brining steps, various possible heat sources, the smoking procedure, and the care and storage of the finished product. Finally they give the details for pickling fish ("pickled" fish should be applied only to those products in which vinegar is used, they say)--the requirements for the water, vinegar, salt, sugar, and spices and the pickling procedure. Pickling smelt is treated separately.

[7 figures, 4 references] LB

3.2342 SYMPOSIUM: DIRECT CONTACT REFRIGERANT FREEZING OF FOODS

ASHRAE Journal 13, No. 6, 33-43 (June 1971)

The following three articles were presented at the Symposium on Direct Contact Refrigerant Freezing of Foods during the ASHRAE Semiannual Meeting in San Francisco, Calif., January 1970.

"Direct Refrigerant Freezing of Foods Using Freezant-12," by John J. Daly, Jr. (Technical and Marketing Development, "Freon" Products Division, E. I. du Pont de Nemours & Co. Inc., Wilmington, Del.), pp. 33-35.

The patented liquid "Freon" freezant systems were introduced commercially in 1968 and are currently being used in the United States for freezing fruits, vegetables, seafood, and poultry. By this method, the food and refrigerant (liquid dichlorodifluoromethane, food grade) are placed in direct contact at the atmospheric pressure boiling point of the refrigerant. The food is subsequently frozen; the refrigerant vaporizes and is condensed and recycled. The author claims that this method of freezing food offers the following advantages: (1) Improved food quality; (2) no dehydration of the food (hence a higher yield); (3) reduction in bacteria count; (4) minimum space requirements for the equipment; (5) flexibility of use of equipment; and (6) mobility of equipment.

[3 illustrations]

"Recent Advances in the Liquid Nitrogen Freezing of Foods," by J. T. Sills (Food Industry Department, Air Products & Chemicals, Allentown, Pa.), pp. 36-41.

This article gives some information on the use of liquid nitrogen for the commercial freezing of foods. It includes some highlights of the background of

(over)

4.13 INVESTIGATION OF THE FATTY ACID COMPOSITION OF OILS AND LIPIDS FROM THE SAND LAUNCE (AMMODYTES AMERICANUS) FROM NOVA SCOTIA WATERS

Ackman, R. G., and C. A. Eaton (Fisheries Research Board of Canada, Halifax Laboratory, Halifax, Nova Scotia)
Journal of the Fisheries Research Board of Canada 28, No. 4, 601-606 (April 1971)

The two principal lipids, triglycerides and phospholipids, from the oil extracted from the sand launce were separated and examined. The purpose was to obtain information that might be useful for the commercial utilization of this fish.

A commercial oil from sand launce, and triglyceride fractions from lipids of two samples of the fish from Nova Scotia waters, showed about the same fatty acid composition as herring oils. Thus, the commercial utilization of sand launce oil would be practical. The composition of methyl esters of fatty acids derived from sand launçe oil and lipid fractions are shown (by groups) in the table that follows (the original table in the article gives the content of each fatty acid within each group):

(over)

3.2342

the process, a description of the process, and present status and future projections for the process.
[9 figures, 4 tables, 1 reference]

"Freezing Preservation of Foods With Carbon Dioxide & Dry Ice," by Kenneth A. Lehner (Airco Industrial Gases--Pacific, Vernon, Calif.), pp. 41-43.

Carbon dioxide contact freezing can be accomplished easily and is adaptable to automated production lines. Further, CO_2 can be of benefit as a preservative to certain foods, for example in the "crust-freezing" and preservation of meat.
[2 illustrations] FTP

4.13

Fatty acid group	Weight percent of methyl esters of fatty acids derived from sand launce: Commercial oil (June 1968)	Lipids (July 1970) Triglyceride	Lipids (July 1970) Phospholipid
Total saturated acids	24.1	23.1	31.5
Total monounsaturated acids	49.2	53.7	19.37
Total polyunsaturated acids	27.2	23.1	49.1

[2 tables, 22 references] FTP

3.15 (2.05) EFFECTS OF RADIATION PASTEURIZATION ON SALMONELLA. III. RADIATION LETHALITY AND THE FREQUENCY OF MUTATION TO ANTIBIOTIC RESISTANCE

Previte, J. J., Y. Chang, and H. M. El-Bisi (Microbial Division, Food Laboratory, U.S. Army Natick Laboratories, Natick, Mass.)
Canadian Journal of Microbiology 17, No. 3, 385-389 (March 1971)

The data presented in this paper indicates that the application of radiation preservation, with the proper choice of processing parameters, could drastically reduce the possibility of transmission of Salmonella by poultry and thereby decrease the public health hazards associated with this microorganism.
[3 figures, 1 table, 20 references] FTP

3.4 ADVICE ON SMOKE CURING

Anonymous
Fishing News International 10, No. 6, 75 (June 1971)

This article announces the availability of the publication titled "Smoke Curing of Fish," issued by the Food and Agriculture Organization of the United Nations Department of Fisheries, FAO Fisheries Reports No. 88, Rome, Italy. The booklet discusses the principles of smoke curing and describes processes for cold and hot smoking of fish. The booklet describes the smoked fish products produced in the more developed countries and also the traditional products produced in tropical countries. It includes information on equipment used in primitive and the modern processes, and suggestions on packaging, storing, and distributing smoked fish products. FTP

3.234 FREEZING APPARATUS

Elmwood Liquid Prods. Inc. (pat.)
British Patent 1,212,668
Food Technology 25, No. 7, 77 (July 1971)

The apparatus consists of a tunnel in which the precooling and postfreezing zones are mechanically refrigerated and the intermediate zone contains cryogenic liquid (boiling point below -100° F.). FTP

4.14 (1.953) FATTY ACID COMPONENTS OF BLACK RIGHT WHALE OIL BY GAS CHROMATOGRAPHY

Tsuyuki, Hideo, and Shingo Itoh (Japan)
Chemical Abstracts 74, No. 11, 51194b (March 15, 1971)

3.11 FISH PRESERVATION

Furia, T. E.; Gelgy Chemical Corp. (pat.)
U.S. Patent 3,563,770
Food Technology 25, No. 6, 62 (June 1971)

Aqueous compositions containing certain 2-hydroxy-polychlorodiphenyl ethers and polyalkylene - polyaminepolyacetic acid salts are used to preserve fresh fish. FTP

3.4 SMOKED FLAVORED MEAT PRODUCTS

Connick, F. G.; Swift (pat.)
Canadian Patent 861,439
Food Technology 25, No. 6, 64 (June 1971)

Liquid wood smoke is sprayed on the inside surface of the containers and then the containers are filled with meat and dry gelatin. The filled, sealed containers are allowed to stand to allow the liquid smoke to be absorbed on the meat. The product is then heat processed. FTP

4.5 EFFECT OF INGREDIENTS ON THE OXYGEN UPTAKE OF COOKED, FREEZE-DRIED COMBINATION FOODS

Tuomy, Justin M., and Walter Fitzmaurice (Food Laboratory, U.S. Army Natick Laboratories, Natick, Mass. 01760)
Journal of Agricultural and Food Chemistry 19, No. 3, 500-503 (May-June 1971)

The porous nature of freeze-dried foods renders them susceptible to oxidation. Various foods, however, respond differently to oxygen; some foods exhibit antioxidant properties and other foods exhibit prooxidant properties. In the present study, the principal ingredients of eight cooked, freeze-dried combination foods (used in armed forces operational rations) were examined for their antioxidant or prooxidant activity. The products were beef hash, beef stew, beef with rice, chicken and rice, chicken stew, chili con carne, pork with potatoes, and spaghetti with meat sauce.

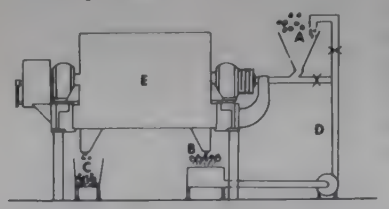
Each product was prepared in successive stages (partial formulations) with the last stage being the complete product. Samples were taken at each stage and were freeze-dried and stored in cans under atmospheric pressure at 40°, 70°, or 100° F. for 12 weeks. Oxygen uptakes of the samples were determined at 2,4, 8, and 12 weeks.

Certain ingredients (rice, chili beans, and vegetable oil) had antioxidant properties; others (tomato paste, some seasoning mixes, and white sauce) had prooxidant properties. The antioxidant or prooxidant activity of an ingredient probably varies depending upon the other ingredients present. Also, the processing conditions will significantly affect the oxygen uptake of the meat component.
[4 tables, 14 references] FTP

6.50 (2.3) THE SEPARATION OF CRAB MEAT FROM SHELL & TENDON BY A CENTRIFUGAL PROCESS

Tretsven, Wayne I. (Fishery Products Technology Laboratory, National Marine Fisheries Service, NOAA, 2725 Montlake Blvd. E., Seattle, Wash. 98102)
Commercial Fisheries Review 33, No. 5, 48-49 (May 1971)

A commercial-type centrifuge was used to recover meat from crab shell scrap (the shell material remaining after the crab meat is removed by hand). A diagram of the process is shown in the figure below. The crab shell scrap was chopped into pieces ranging in size from 1/8 to 1/2 inch and pieces were fed into the hopper (A in the diagram). The centrifuge separated the scrap into shell-free meat and shell. Yield of meat from cooked shell scrap of blue crab legs was 31% (by weight); of snow crab bodies, 52%; and of snow crab legs, 29%. FTP



A CHOPPED CRAB INLET
B CRAB MEAT
C CRAB SHELL
D PIPING RECIRCULATING MEDIUM
E CENTRIFUGE

Diagram of centrifugal process for separation of crab meat from shell.

6.31 (1.013) [NOTES ON THE MARINE FLORA OF VENEZUELA] ADICIONES A LA FLORA MARINA DE VENEZUELA

Díaz-Piferrer, M. (Departamento de Biologia, Recinto Universitario de Mayagüez (C.A.A.M.), Universidad de Puerto Rico, Mayagüez, P.R.)
Caribbean Journal of Science 10, No. 3-4, 159-198 (September-December 1970) (In Spanish; English summary)

In 1966, the Oceanographic Institute of the Universidad de Oriente in Cumaná, UNESCO's Office for Marine Research in Latin America, the Department of Biology (C.A.A.M.) of the University of Puerto Rico in Mayagüez, and the Industrial Research Laboratory of the Puerto Rican Economic Development Administration of Fomento combined in sponsoring a Phycological Expedition to Venezuela. Using the specimens and data collected during the expedition as a base, the author has already published papers (1) on the remarkable effects on Venezuela's marine flora of an upwelling of cool waters, (2) on the species and distribution of the marine algae of potential economic importance, and (3) on a new species of Caulerpa from deep waters. The present paper adds new records of benthic marine flora to Venezuela's marine floristic catalog.
[60 plates, 115 references] LB

6.54 ISOBUTANOL AS SOLVENT FOR FPC PRODUCTION

Hevia, Patricio, Fernando Acevedo, and Sergio Kaiser (Instituto de Investigaciones Cientificas y Tecnológicas, Universidad Católica de Valparaiso, Chile)
Journal of Food Science 36, No. 4, 708-709 (May-June 1971)

Because isobutanol will soon be produced commercially in Chile, the authors studied the feasibility of using it, instead of isopropanol, as the solvent in the production of fish protein concentrate (FPC). Hake (Merluccius gayi), readily available off Chile, was used as the fish raw material. The general process for the experimental production of FPC consists of: wash the whole fish with fresh water; comminute the fish; extract the comminuted fish with solvent (in this experiment, with isobutanol) for 30 min. at room temperature and for 4 hr. at 90° C.; continuously extract water and volatiles by azeotropic distillation, wash extracted material with pure solvent; and then dry extracted and washed fish material at 25 mm. Hg at 60°-65° C. for 18 hr. The resulting fish protein concentrate is finally ground into a fine flour.

The FPC produced from hake and using the solvent isopropanol had a light color, no odor, but a slightly fishy taste. Its composition consisted of 80% protein, 0.3% fat, and 4% volatile matter. The protein efficiency ratio (PER) was 2.9, the same value obtained in the control test with casein. The pepsin digestibility value was 97.2% and the available lysine value was 7.5%.

The authors conclude that isobutanol appears to be technically suitable as a solvent for the production of FPC from hake by the azeotropic process; the economics of the process, however, remain to be established.
[3 tables, 17 references] FTP

6.36 STUDIES ON THE APPLICATION OF CYANOPHYTA IN JAPAN

Watanabe, Atsushi (Biological Laboratory, Seijo University, Setagaya-ku, Tokyo, Japan)
Schweizerische Zeitschrift für Hydrologie 32, No. 2, 566-569 (1970)

The author surveys the various species of blue-green algae grown in Japan and discusses their use as food, medicine, and fertilizer. Since time immemorial Aphanothece sacrum (Suringar) Okada, Nostoc verrucosum Vaucher, N. commune Vaucher, and Blachytrichia quoyi (Ag.) Born et Flah. have been used as side dishes; recently a species particularly rich in protein and vitamins, Spirulina maxima, is being investigated as a new food resource. Of the 16 species of Cyanophyta examined by the author, only Spirulina platensis and Arthrospira sp. yielded large enough quantities of γ-linolenic acid to be a potential source of the amounts needed in connection with medical treatment of the circulation of fatty acid. Although the use of nitrogen-producing Tolypothrix tenuis increased the yield in over 40 experimental fields scattered about Japan, the increase was never as great as it proved to be in India, probably due to the higher temperature of the air, the more general alkalinity of the water, and the lower nitrogenous manuring practices in India.
[2 tables, 7 references] LB

6.54 MOISTURE ADSORPTION OF FISH PROTEIN CONCENTRATE AT VARIOUS RELATIVE HUMIDITIES AND TEMPERATURES

Rasekh, Jamshid G., Bruce R. Stillings, and David L. Dubrow (U.S. Department of Commerce, NOAA, National Marine Fisheries Service, National Center for Fish Protein Concentrate, College Park, Md. 20740)
Journal of Food Science 36, No. 4, 705-707 (May-June 1971)

The moisture adsorption isotherms of fish protein concentrate (FPC) were determined at 25°, 35°, and 42° C. in constant relative humidities (RH) ranging from 11 to 86%. FPC (prepared by isopropanol extraction) from red hake and from menhaden was used. The FPC was ground to two particle sizes; a portion of the milled samples was steam stripped to remove any residual isopropanol.

The equilibrium moisture content of the FPC samples ranged from about 5% (at 11% RH) to about 16% (at 86% RH). Apparently, particle size of the FPC did not affect the adsorption of moisture. The steam-stripped samples of FPC adsorbed slightly more moisture at low RH values and slightly less moisture at high RH values than did the nonsteamed samples. The FPC prepared from hake adsorbed slightly more moisture than did comparable samples of FPC prepared from menhaden.
[4 figures, 2 tables, 12 references] FTP

6.190 PIGMENTATION OF BROOK TROUT (SALVELINUS FONTINALIS)
(9.16) BY FEEDING DRIED CRUSTACEAN WASTE

Saito, Akira, and L. W. Regier (Fisheries Research Board of Canada, Halifax Laboratory, Halifax, Nova Scotia)
Journal of the Fisheries Research Board of Canada 28, No. 4, 509-512 (April 1971)

Shrimp and crab wastes were fed to yearling brook trout for 12 weeks in order to determine the rate that carotenoids are incorporated into the muscle and skin of the fish. The test diets contained 20% and 30% shrimp waste, 20% crab waste, or 0.004% canthaxanthin; a commercial trout diet was used as the control.

When dried shrimp waste is fed to brook trout the carotenoid compounds in the waste can be incorporated into the flesh and skin of brook trout within 8 to 12 weeks. The carotenoid level in the flesh and skin of the trout was highest in those fish fed canthaxanthin, but the trout fed the diet containing 20% shrimp waste had the most desirable color (visual examination). The crab waste had only a slight effect on the pigmentation of the brook trout.
[2 tables, 8 references] FTP

6.50 FISH PROCESSING

Ehrensvärd, C. H. G., B. V. Löfqvist, L. B. Sjöberg; Astra Nutrition Aktiebolag (pat.)
Canadian Patent 863,874
Food Technology 25, No. 6, 64 (June 1971)

Fish materials are treated with aqueous alkaline calcium ion then homogenized in the absence of air. The homogenized mixture is centrifuged to produce three phases: an oil phase, a sludge phase, and an intermediate phase containing protein.
FTP

6.54 FISH PROTEIN CONCENTRATE

Rutman, M.; Instituto de Fomento Pesquero (pat.)
U.S. Patent 3,561,973
Food Technology 25, No. 6, 62 (June 1971)

This patent covers a process for the preparation of a water-soluble, odorless fish protein concentrate. The enzyme bromelin is used to hydrolyze the fish protein. FTP

7.42 DETERMINATION OF METHYLMERCURY IN FISH AND IN CEREAL GRAIN PRODUCTS

Newsome, William H. (Research Laboratories, Food and Drug Directorate, Department of National Health and Welfare, Ottawa, Canada)
Journal of Agricultural and Food Chemistry 19, No. 3, 567-569 (May-June 1971)

Current methods for the determination of methylmercury in fish involves the acidification of an aqueous homogenate of the tissue followed by extraction with benzene. In subsequent steps an emulsion formed, probably due to presence of lipoprotein materials, rendering the method unsatisfactory. The author eliminated this problem by modifying the existing methods for fish by incorporating a filtration step and by the use of hydrobromic acid rather than hydrochloric acid to enhance the partition ratio and facilitate the extraction of methylmercury from the aqueous phase. The centrifugation step to separate the benzene and homogenate was eliminated. The recovery of methylmercury in whitefish was 94% ± 6%, and in cod it was 98% ± 6%.
[2 tables, 5 references] FTP

7.1 (9.13)(1.85) A SIMPLE METHOD TO DETERMINE THE O:N RATIO OF SMALL MARINE ANIMALS

Snow, N. B., and P. J. LeB. Williams (Department of Oceanography, The University, Southampton)
Journal of the Marine Biological Association of the United Kingdom 51, No. 1, 105-109 (February 1971)

The usefulness of the O:N ratio (oxygen consumed to ammonia nitrogen excreted) in nutritional studies of marine organisms was made evident by the studies of Harris (1959) on the mixed zooplankton in Long Island Sound. In this report, the authors describe a simple method for determining the O:N ratio of small marine invertebrates. They measure O with an oxygen electrode and then analyze the water sample for α-amino nitrogen using a ninhydrin method. By removing the ammonia under alkaline conditions, they distinguish between the amino nitrogen and the ammonia nitrogen in the water sample.

Results of using the method with the prawn Palaemonetes varians (Leach) indicate that ammonia is the main nitrogenous excretory product of this species. It probably catabolizes protein during the winter, for the O:N ratio averages 6.1 from December through February. In contrast, the ratio from May through July averages 34.2, indicating that fat or carbohydrate, or both, are being used.
[1 figure, 2 tables, 11 references] LB

7.43 (9.19) THE USE OF ULTRA-VIOLET ABSORPTION MEASUREMENTS FOR THE ESTIMATION OF ORGANIC POLLUTION IN INSHORE SEA WATERS

Foster, P., and A. W. Morris (Marine Science Laboratories, Menai Bridge, Anglesey, North Wales)
Water Research 5, No. 1, 19-27 (January 1971)

Variations in the spectra of sea water samples of different origin are primarily a result of differences in the dissolved organic content of the waters, together with differences in the concentration of nitrate ion, which absorbs strongly in the wavelength region below 235 nm. It has been proposed that measurements of ultraviolet absorption may be useful as a supplement to other physical methods of characterizing water masses; moreover, they may give information about the chemical properties of the water. Ogura and Hanya (1968) experimented with use of absorbance measurements as a simple and rapid method of estimating the degree of organic pollution of sea waters.

Pollution measurements are required principally in inshore waters, where the concentrations of nitrate, bromide, and dissolved organic matter all exhibit wide natural variations, both intermittently and with the season. The variations are caused by the mixing of varying proportions of fresh and salt water; superimposed on the mixing pattern are the effects of biological production. The satisfactory use of ultraviolet absorption measurements as an indicator of organic pollution therefore depends on the identification of the influence of the pollution source in the presence of the effects of changing concentrations of naturally occurring ultraviolet-absorbing species. The authors attempted to interpret the influence of natural chemical changes on the ultraviolet absorption spectra of sea waters.
(over)

7.1 SOME RECENT ADVANCES IN THE THEORY OF GAS CHROMATOGRAPHY

Sewell, Peter A. (Department of Chemistry, Liverpool Polytechnic, Liverpool, L3 3AF, England)
Critical Reviews in Analytical Chemistry 2, No. 1, 51-103 (June 1971)

Major subject areas in the table of contents of this review are Introduction; The Retention Equation; Solvent Selectivity; Column Efficiency; Resolution and Peak Capacity; Optimum Column Conditions for Separation; Solute Structure-Retention Relationships; High Precision in Gas Chromatography; Future Trends; and References. [21 figures, 9 tables, 140 references] FTP

7.42 THE INDIRECT DETERMINATION OF MICROAMOUNTS OF MERCURY(II) BY MEANS OF DITHIZONE EXTRACTION AND AC POLAROGRAPHY

Kambara, Tomihito, and Minoru Hara (Department of Chemistry, Faculty of Science, Hokkaido University, Sapporo, Japan)
Bulletin of the Chemical Society of Japan 44, No. 4, 1040-1043 (1971)

Mercury was determined indirectly by making use of the characteristic whereby dithizone in an aqueous solution shows sharp AC polarographic peaks. Microamounts of mercury(II) dithizone are extracted into benzene and the excess dithizone in the organic layer is back extracted into an aqueous ammonia solution. The mercuric ion is stripped into the aqueous phase containing iodide ion. The isolated dithizone in the benzene layer is back extracted into an alkaline-supporting electrolyte solution and the polarogram is recorded. Up to 30 μg. of mercury can be detected by the method. [5 figures, 1 table, 9 references] FTP

6.55 DIET AND EGGSHELL QUALITY
(6.82)

Scott, M. L. (Cornell University, Ithaca, N.Y.)
Feedstuffs 43, No. 25, 31-32 (June 19, 1971)

Estimates of the eggshell breakage on the farm and in the processing plant are from 8 to 10% of the total number of eggs produced. Apparently the key to reduction in the amount of breakage of eggs lies in the bringing about of an increase in the strength of the eggshell. The experiments described in this article show that hens (chicken) receiving 2/3 oyster shell and 1/3 ground limestone (the calcium level was set at 3.5% of the diet) produced eggs that were much more resistant to breakage than those hens receiving a diet containing all the calcium supplement as ground limestone. The proportion of 2/3 oyster shell and 1/3 ground limestone appears to produce a maximum improvement in the breaking-strength of the eggshell and at the same time to support maximum production of eggs.
[5 tables, 10 references] FTP

6.59 AUTOLYZATES FROM FISH AND ICHTHYOLOGICAL MATERIAL

Lamotte, Georges (pat.)
German Offen. (Patent) 2,016,244 (Oct. 8, 1970)
Chemical Abstracts 74, No. 11, 52308d (March 15, 1971)

7.43 (9.19)

Changes in the spectra were monitored at 4-day intervals for a year. The changes were integrated in terms of autochthonous biological activity and of the variable supply of organic matter from the major sources of land drainage. Since molecular differences in the organic matter from these sources cause seasonal variations in both the degree of absorption per unit of dissolved organic carbon and the relative absorption within different wavelength regions, the correlation between the ultraviolet absorption and the content of dissolved organic carbon was poor. In addition, appreciable short-term variations in spectra severely limited the use of the method as an indicator of marine organic pollution.
[7 figures, 7 references] LB

7.43 ROLE OF NUCLEAR MAGNETIC RESONANCE SPECTROSCOPY AND MASS SPECTROMETRY IN WATER POLLUTION ANALYSIS
(0.112) (9.19)

Keith, Lawrence H., Arthur W. Garrison, M. M. Walker, Ann L. Alford, and Alfred D. Thruston, Jr. (Southeast Water Lab., FW-PCA, Athens, Ga.)
Chemical Abstracts 74, No. 22, 115665r (May 31, 1971)

8.0 ALASKA KING CRAB: FATTY ACID COMPOSITION,
(8.53) CAROTENOID INDEX AND PROXIMATE ANALYSIS

Krzeczkowski, Richard A., R. D. Tenney, and C. Kelley (U.S. Department of Commerce, NOAA, National Marine Fisheries Service, Marine Fisheries Center, Box 1638, Kodiak, Alaska 99615)
Journal of Food Science 36, No. 4, 604-606 (May-June 1971)

This paper reports the fatty acid content, proximate analysis, and carotenoid distribution in the meat of the king crab (Paralithodes camtschatica). The data are presented for the whole-crab meat and for each of five classes of meat commercially prepared from the king crab: body-shoulder, merus, propodus-carpus, claw and arms, and tails. Such information is useful in establishing the technology of crabmeat production and the nutritive value of crabmeat products.

The fatty acid composition of all classes of the king crab meat was similar. The fatty acids 16:0, 16:1, 18:0, 18:1, 20:1, 22:1, and 20:5 constituted about 77% of the total fatty acid content. Twenty-six other fatty acids were present in low concentrations. The predominant fatty acids were: 20:5 (20.0 to 29.5% of the total fatty acids); 18:1 (15.0-17.1%); and 22:6 (10.2 to 11.2%). Polyunsaturated fatty acids constituted 50.2 to 56.4% of the total fatty acids; monounsaturated fatty acids, 29.8 to 33.5%; and saturated fatty acids, 14.6 to 17.0%.

The proximate composition varied slightly among the different classes of crab meat: protein ranged from 16.3 to 20.7%; ash, from 1.3 to 1.8%; lipid, from 0.9 to 3.3%; and moisture, from 76.2 to 79.6%.

The propodus-carpus meat had the highest carotenoid content; the shoulder meat had the lowest. The skin contained most of the lipid and the carotenoids.
[2 tables, 20 references] FTP

7.85 COMPARISON OF TWO PROCEDURES FOR ENUMERATION OF MICROORGANISMS FROM FROZEN FOODS

Lee, J. S., and LeeAnn Harward (Department of Food Science and Technology, Oregon State University, Corvallis, Ore. 97331)
Journal of Milk and Food Technology 33, No. 6, 237-239 (June 1970)

Bacterial counts were made of frozen raw shrimp, frozen processed shrimp, and frozen mixed vegetables using various combinations of recovery media, diluents, spread or pour-plate technique, and incubation temperatures of 27° C. or 35° C.

Higher bacterial counts were obtained when the plates were incubated at 27° C. than when they were incubated at 35° C. The spread-plating technique yielded higher bacterial counts than did the pour-plate technique. The addition of 0.5% salt and 0.5% peptone to the agar medium gave higher bacterial counts than did the regular plate count agar for the frozen raw shrimp but showed no difference on the bacterial counts for frozen processed shrimp or for the frozen mixed vegetables when used as a diluent. Butterfield's phosphate buffer was slightly superior to 0.2% peptone.

The results point out that the proper analytical procedure must be selected in order to best reflect the bacterial flora of a particular product.

[3 tables, 10 references] FTP

9.10 (1.0149) MARINE BIOLOGY AND THE MARINE BIOLOGIST IN YUGOSLAVIA

Major, Richard L. (National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Biological Laboratory, 2725 Montlake Blvd. East, Seattle, Wash. 98102)
BioScience 21, No. 6, 261-265 (March 1971)

On an exchange visit sponsored by the U.S. National Academy of Sciences and the Council of the Yugoslav Academies of Sciences and Art, the author spent some 6 months at the Institute for Oceanography and Fisheries in Split, Yugoslavia. One of the underlying motives of the exchange program is to give scientists of the participating nations a better understanding of the research climate in each nation--and to promulgate that understanding as widely as possible. In this report, the author describes Yugoslavia's marine biological stations, outlines her research programs, and discusses the status of her marine biologists.

Productivity, commercial fisheries, and pollution are the primary subjects of the research programs at Yugoslavia's four major Adriatic-based marine biological laboratories. One-third of the marine scientists are women. About 40% of all scientists working at these laboratories have a Ph.D. degree; most of the others have an M.S. or its equivalent; most have either studied or worked abroad. Salaries are determined by the scientists themselves.

[4 figures, 1 table] LB

8.42 (1.80) THE DISTRIBUTION OF THE MAJOR AND SOME MINOR ELEMENTS IN MARINE ANIMALS PART II. MOLLUSCS

Segar, D. A. (School of Marine and Atmospheric Sciences, University of Miami, Fla.) J. D. Collins, and J. P. Riley (The Department of Oceanography, University of Liverpool, England)
Journal of the Marine Biology Association of the United Kingdom 51, No. 1, 131-136 (February 1971)

The soft tissues of mollusks contain relatively high concentrations of certain trace elements, mainly transition metals. In this article, the authors report the usual levels of 6 major elements and 13 trace ones found in the shells and entire soft parts of 11 marine and 1 fresh-water mollusks. The marine mollusks examined were Pecten maximus, Chlamys opercularis, Glycymeris glycymeris, Modiolus modiolus, Patella vulgata, Nucella lapillus, Mytilus edulis, Cardium edule, Mercenaria mercenaria, Buccinum undatum, and Crepidula fornicata, caught at two locations in the Irish Sea; the fresh-water mollusk, Anodonta sp., was caught in the lake at Aberffraw, Anglesey.

Except for iron, strontium, and zinc, the compositions of all marine species but P. vulgata were similar. Variations were appreciable among animals of the same species and even between the upper and lower valves of the same animal, but no variations could be attributed to taxonomic differences. The concentration of available iron in the two environments probably accounts for the difference in iron content in the shells (and, as a rule, the soft parts) of the marine mollusks. The shell of P. vulgata contained unusually high concentrations of copper, lead, and zinc; however, the highest concentrations of zinc were found in G. glycymeris. The shell of the fresh-water species was distinguishable by its high manganese content.

 (over)

9.11 (2.12) RESULTS FROM THE GULF STREAM DRIFT MISSION. PART I

Haigh, Kenneth R. (Admiralty Underwater Weapons Establishment, Portland, England)
Underwater Journal and Information Bulletin 3, No. 1, 13-21 (February 1971) (300 East 42nd Street, New York, N.Y. 10017)

On July 14, 1969, six men in the submersible Ben Franklin submerged in the Gulf Stream off West Palm Beach, Fla., and drifted for just over a month with the Stream. They emerged 1,440 nautical miles later, 350 miles south of Halifax, Nova Scotia. Their main objectives were to travel a maximum distance along the core of the Gulf Stream, at varying depths; to investigate the analog aspects of a submersible and a space station during a long, stressful voyage in a closed environment; and to demonstrate the engineering and operational concepts associated with long-duration submersible operations. They showed that oceanographic research can be carried out undisturbed by the vagaries of the air-sea interface, and they established and proved the validity of techniques that will allow aquanauts to live for extended periods in a closed environment, isolated biologically and sociologically from the normal world.

Part I of the report describes the life-science experiments and results--the habitability and maintainability of the submersible, including cabin environment, sources and production of volatile metabolically generated contaminants, water and food management, space allocation and utilization, clothing and bedding, microbiology, psychology and physiology.

Part II will report results of the oceanographic work.

[4 figures, 1 table, 4 photographs] LB

8.42 (1.80)

As for the soft parts, the fresh-water animal contained much more calcium but less sodium, potassium, and magnesium than the marine animals did. With two exceptions the concentrations of the major elements were relatively constant in the soft parts of the marine mollusks: N. lapillus, B. undatum, and M. mercenaria had a low concentration of sodium; and P. vulgata and N. lapillus had a high concentration of calcium.

The concentrations of trace elements in the soft parts varied considerably from species to species. All were considerably higher in the soft parts of the animals than in the marine environment. The highest concentrations were in the digestive organs and the gills; the lowest, in the shells.

[4 tables, 4 references] LB

9.125 (9.3)(1.11)

ALGUMAS OBSERVAÇÕES OSTEOLÓGICAS E MERÍSTICAS SÔBRE A CAVALA, SCOMBEROMORUS CAVALLA (CUVIER), DO NORDESTE BRASILEIRO
[SOME OSTEOLOGICAL AND MERISTIC OBSERVATIONS ON THE KING MACKEREL, SCOMBEROMORUS CAVALLA (CUVIER), FROM NORTHEAST BRAZIL]

Ferreira de Menezes, Mariana (Labóratorio de Ciências do Mar, Universidade Federal do Ceará, Fortaleza, Ceará, Brasil)
Arquivos de Ciências do Mar 9, No. 2, 175-178 (December 1969) (In Portuguese; English summary)

King mackerel, which is abundant along the northeast coast of Brazil, is the basis of a highly valuable Brazilian fishery. In 1966, Cervigón reported on the geographical distribution of the species from the Gulf of Maine as far south as Rio de Janeiro, including the whole of the Gulf of Mexico. The present paper deals with the osteological and meristic differences between the mackerel found along the coast of Brazil, those found along the Atlantic coast of the United States, and those found in the Caribbean Sea. The Brazilian mackerel has longer cranial bones than the other two mackerels have; it has from 6 to 13 gill rakers and either 41 or 42 vertebrae, whereas the other two have 8 or 9 gill rakers and 42 or 43 vertebrae.

[8 figures, 2 tables, 5 references] LB

8.42 METAL-BEARING DEPOSITS OF FISH BONES DETRITUS

Kochenov, A. V., M. M. Mstislavskii, and A. S. Stolyarov (U.S.S.R.) Chemical Abstracts 74, No. 20, 101599k (May 17, 1971)

7.85 (0.5)(2.09)

POLYMYXIN-COAGULASE-MANNITOL-AGAR
II. ISOLATION AND IDENTIFICATION OF COAGULASE-POSITIVE STAPHYLOCOCCI FROM FROZEN SHRIMP

Lee, J. S., D. S. Orth, and A. W. Anderson (Department of Food Science and Technology,and Department of Microbiology, Oregon State University, Corvallis, Ore. 97331)
Journal of Milk and Food Technology 33, No. 8, 355-357 (August 1970)

In this study, the authors examined the comparative ability of Polymyxin-Coagulase-Mannitol-Agar (PCMA), Vogel and Johnson Agar (VJA), Staphylococcus Medium No. 110 with azide (SMa), and Trypticase Soy Agar (TSA) to isolate Staphylococcus aureus from frozen foods of the market. The data reported here deal with frozen shrimp because this product yielded coagulase-positive staphylococci under the prescribed test conditions.

When spread-plating technique was used, PCMA recovered higher numbers of coagulase-positive staphylococci than did the other three media (VJA, SMa, TSA). Use of PCMA allowed identification of coagulase-positive staphylococci within 24 hr.; the other selective media required 48 hr. for growth plus 24 hr. for confirmation of identity of the coagulase-positive staphylococci.

The comparative effectiveness of the four media was examined using cross-replica-plating technique. Fewer colonies developed on PCMA than on the other three media but a greater percentage of the colonies on PCMA were coagulase-positive staphylococci.

[1 figure, 1 table, 14 references] FTP

9.10 ELECTRONIC PROCESSING OF ACOUSTICAL DATA FOR FISHERY RESEARCH

Lenarz, William H., and James H. Green (Fisheries Research Institute and Division of Marine Resources, University of Washington, Seattle, Wash.)
Journal of the Fisheries Research Board of Canada 28, No. 3, 446-447 (March 1971)

This article contains a description of a system for processing acoustical data for the study of fish behavior. The acoustical data are recorded in the field on magnetic tape in analog form. The data then are converted to digital form and analyzed with the aid of a digital computer. This system provides considerably more information than do the paper records now in common use. A detailed description of the electronic circuitry and computer software is available from the Fisheries Data Analysis Center, Fisheries Research Institute, University of Washington, Seattle, Wash. 98105, U.S.A.

[2 figures, 5 references] FTP

9.13 (1.37)

EFFECT OF MELATONIN ON BODY COLORATION AND SPONTANEOUS SWIMMING ACTIVITY IN RAINBOW TROUT, SALMO GAIRDNERI

Hafeez, Mohammad A. (Dep. Zool., Univ. California, Berkeley, Calif.) Chemical Abstracts 74, No. 3, 10813j (January 18, 1971)

9.13 LIPID CONTENT OF THE ORGANS OF THE COCONUT CRAB, BIRGUS LATRO (L.) (DECAPODA, PAGURIDEA)

Lawrence, J. M. (Department of Zoology, University of South Florida, Tampa, Fla. 33620)
Crustaceana 19, No. 3, 264-266 (November 1970)

Earlier workers had found high lipid levels in cold water forms of Crustacea and had indicated that this is associated with low environmental temperatures. The present paper reports the lipid level of the organs of a crustacean, the tropical coconut crab Birgus latro (L.), which lives at high temperatures. Two male specimens of the coconut crab were collected on Igurin Island, Eniwetok Atoll, Marshall Islands. The reported minimum air temperature for Eniwetok Atoll is 71° F.; the maximum 89° F.

The author found that the lipid levels in the intestine, muscle, and testis of the coconut crab are equivalent to that reported for temperate environment crustacea. Also, the lipid level in the hepatopancreas of the coconut crab is greater than that reported for temperate environment crustacea and is equal to the average reported for a cold environment isopod.

[7 references] FTP

9.14 STUDIES ON CARP NUTRITION III. EXPERIMENTS ON THE AFFECT [SIC] ON FISH YIELD OF DIETARY PROTEIN SOURCE AND CONCENTRATION

Hepher, B., J. Chervinski (Fish Culture, Research Station, Dor, Israel), and H. Tagari (Faculty of Agriculture, The Hebrew University, Rehovoth, Israel)
Bamidgeh 23, No. 1, 11-37 (March 1971)

In previous experiments, the authors found that a protein-rich diet fed to fish would affect yields appreciably, increasing the yield by more than 50% when the fish population was denser than 800-1,000 kg./ha. In the present experiments, conducted from 1965 through 1967, they investigated the effect of different dietary protein contentrations, rates of feeding, protein sources, and pond-stocking rates on the yield of pond-reared carp. They also examined some of the interactions of these factors.

The carp were raised in 21 identical ponds, 0.1 ha. in area and 80 cm. in average depth. The ponds were fertilized every 2 weeks at a rate of 60 kg. superphosphate, 60 kg. ammonium sulfate, and 100 kg. dry chicken manure/ha. Wheat, corn in various forms, fish meal, soybeans in various forms, skim milk, and blood meal were fed in various combinations and at various rates; one of the diets containing only cereal proteins was supplemented with synthetic lysine and methionine. Sorghum and wheat diets served as controls. The fish were fed once a day, 6 days a week, on diets ranging in protein content from 20 to 28%. Evaluation of the effects of the diets consisted of determining the fat, moisture, and protein content of the scaled, eviscerated fish.

An analysis of the results showed that protein-rich diets will affect carp growth only when the natural growth in the pond is inadequate for the fish's protein requirements. Two diets of different protein content will give exactly the

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9.14 (9.15) RELATIONS TROPHIQUES ENTRE LE PLANCTON, LES HUÎTRES D'ÉLEVAGE ET LES CIONES, ÉPIBIONTES (ÉTANG DE THAU) [TROPHIC RELATIONS BETWEEN PLANKTON, CULTURED OYSTERS, AND CIONA (EPIBIONTS) IN ÉTANG DE THAU]

David, Annick (Animal Biology Laboratory (Plancton), Faculty of Sciences, Marseilles, France)
Science et Pêche No. 201, 1-13 (March 1971) (in French)

The work reported here was undertaken in collaboration with personnel from the Institute of Maritime Fisheries' Sête Laboratory, which is at the eastern end of the lagoon called Étang de Thau. It consists of two parts: (1) a characterization of the phytoplankton that make up some of the nutritive resources of that part of the lagoon used for fish culture, and (2) a determination of the trophic relations between the oysters grown there and their parasites. In the second part, the author found a direct relation between the nutritive demands of oysters and Ciona. However, he concluded that the major inconvenience posed by the epibionts (and of the Ciona in particular) that infest immersed oyster bars and collectors lies not in this alimentary competition but in the necessity of the culturist to get rid of the parasites before he markets the oysters. Thus some rapid, efficient, less onerous means of destroying them needs to be found--unless they are to be used as detectors of radioactive pollution, as proposed by Battani et al. in 1968. [8 figures, 15 references] LB

9.17 (9.6)(9.10) A SYMPOSIUM ON THE BIOLOGICAL SIGNIFICANCE OF ESTUARIES

Douglas, Philip A., and Richard H. Stroud (Sport Fishing Institute, 719 Thirteenth St., N.W., Suite 503, Washington, D.C. 20005) (editors)
Published by the Sport Fishing Institute, xi + 111 pp. (March 1971)

Well over half the marine fisheries resources of the Continental Shelf that abuts the U.S. land mass are fully dependent on estuaries as spawning or nursery grounds. Yet this national heritage is being rapidly destroyed for short-term economic gain, both private and municipal. The purpose of this public-oriented symposium (held in Houston, Tex., on February 13, 1970) was to lay the foundation for a symposium to be held the following day in which socio-political aspects of uses of estuaries would be discussed. (The followup symposium was conducted by representatives of the Sportsmen's Clubs of Texas and the National Wildlife Federation.) Both symposia were designed to bring to the lay public, particularly to leadership elements, a comprehensive view of why the estuaries of the United States are important and what American citizens can do to foster their maintenance for a multiplicity of uses--in perpetuity. The sponsors of the symposia expressed the hope that improved communications among aquatic scientists, economists, engineers, sociologists, politicians, planners, and the general lay public would help create an improved climate for solving the problems associated with maintaining the estuarine environment in a productive condition.

Among the papers presented were the following:

"The Biology of the Estuary," by L. Eugene Cronin and Alice J. Mansueti (Chesapeake Biological Laboratory, Natural Resources Institute, University of Maryland, Solomons, Md. 20688); pp. 14-39. [33 figures]

 (over)

9.15 CHONDROCOCCUS COLUMNARIS DISEASE OF FISHES: INFLUENCE OF COLUMBIA RIVER FISH LADDERS

Fujihara, M. P., and F. P. Hungate (Department of Biology, Pacific Northwest Laboratories, Battelle Memorial Institute, Richland, Wash. 99352)
Journal of the Fisheries Research Board of Canada 28, No. 4, 533-536 (April 1971)

The results of this survey suggest that fish ladders may be important sites for transferring the columnaris disease from fish indigenous to the Columbia River to migrating salmonids in the ladder.
[3 tables, 9 references] FTP

9.16 METHOD AND APPARATUS FOR HANDLING FISH

Harden, Darrel G. (1590 S. Oklahoma, Norman, Okla. 73069) (pat.)
U.S. Patent 3,583,365 (June 8, 1971)

In the harvesting of food fish and in other operations requiring the handling of quantities of fish, one of the prime objectives is to maintain the fish in as perfect a physical condition as possible. Attaining this objective is particularly important when the fish are to be released live into ponds, lakes, and rivers to grow and propagate. Presently such fish are transferred in bulk either by scoops or by pumps. Both methods damage some of the fish. The method described here provides a more efficient, less damaging way of transferring live fish from one location to another. Basically it involves pumping a stream of water containing fish through a conduit into a water-filled container; transporting the fish to the desired location; and pumping them out of the container by reversing the flow of water. The important differences in this method and former methods of pumping fish is that the fish never come in contact with the moving parts of the pump. Thus the basic source of injury is eliminated. LB

9.17 (9.6)(9.10)

"The Texas Water Plan and Its Effect on Estuaries," by Charles R. Chapman (Bureau of Commercial Fisheries, U.S. Department of the Interior, Washington, D.C.); pp. 40-57. [2 figures, 6 tables, 10 references]
"The Biological Effects of Estuaries on Shellfish of the Middle Atlantic," by David H. Wallace (Division of Marine & Coastal Resources, New York Conservation Department, Ronkonkoma 11779); pp. 76-85. [7 figures, 3 tables]
"The Effects of Pollution on Estuaries of the Northwest Pacific Coast," by Ernest O. Salo and Quentin J. Stober (Fisheries Research Institute, University of Washington, Seattle, Wash. 98105); pp. 86-95. [7 figures, 8 references]
"The Significance of an Estuary on the Biology of Aquatic Organisms of the Middle Atlantic Region," by William H. Massman (U.S. Bureau of Sport Fisheries and Wildlife, Washington, D.C.); pp. 96-109. [42 references] LB

9.17 DEPARTMENT OF ECOLOGY: NEW ARM OF STATE GOVERNMENT (9.3)

Vollmer, Howard M., and David Ackerman (Stanford Research Institute, Menlo Park, Calif.)
Environmental Science & Technology 5, No. 6, 506-511 (June 1971)

This article describes the design, and the method used to create it, of the new Department of Ecology in Washington State. The authors suggest that some of the features and methods may well be useful to other public and private institutions trying to cope with environmental problems.
[4 figures] LB

9.13 ENDOCRINE CONTROL OF Na-K-ATPASE AND SEAWATER ADAPTATION IN ANGUILLA ROSTRATA (0.38)

Epstein, Franklin H., Michael Cynamon, and William McKay (Yale University School of Medicine, New Haven, Conn., and Department of Biology, Case-Western Reserve University, Cleveland, Ohio)
General and Comparative Endocrinology 16, No. 2, 323-328 (April 1971)

In these experiments, the authors injected intact freshwater eels with cortisol in order to measure the effect of this hormone on the activity of Na-K-ATPase. They found that hydrocortisone induces a series of changes in freshwater eels, including a rise in Na-K-ATPase of gill and intestine, that successfully prepares these euryhaline teleosts to combat the osmotic stress of migration to sea water. [1 figure, 1 table, 31 references] FTP

9.13 (9.12) GEOGRAPHICAL VARIATION IN THE ATLANTIC SALMON

Payne, R. H., A. R. Child, and A. Forrest (Ministry of Agriculture, Fisheries and Food, Salmon and Freshwater Fisheries Laboratory, Weymouth, Dorset, England)
Nature 231, No. 5300, 250-252 (May 28, 1971)

This article presents information on the analysis by starch gel electrophoresis of the serum transferrin phenotypes of 4,492 Atlantic salmon collected during the summers of 1969 and 1970 at several locations in Britain, Ireland, and the Gulf of Saint Lawrence (Canada). The paper further reports the discovery of a serum protein polymorphism in the Atlantic salmon that reveals the existence of genetically isolated populations sufficiently distinct to merit their separation into subspecies and races. [4 figures, 1 table, 13 references] FTP

9.14

same results as long as each is adequate to make up the pond's protein deficiency; when the lower protein diet cannot fill the deficit, however, a higher protein diet is required. The critical point between the sorghum control and the protein-rich diets was at a carp population of about 800 kg./ha.; that between diets containing 22.5% protein and 27.5% protein was at about 1,400/kg./ha.

Fishmeal diets made for better growth than did soybean-meal diets, those containing 22% fish meal giving better results than those containing lesser amounts. Utilization of protein for growth was quite poor for all the protein-rich diets, the conversion ratio increasing as the amount of feed and the density of fish was increased. The authors attribute this to the lack of growth factors involved in protein anabolism. Although increasing the fish-stocking rate decreased the weight gain per fish, it increased the yield per hectare for all diets. The effect of increased stocking rates on yield was greatest when protein-rich diets were fed. The increase in fish growth for these fish was due mainly to gain in body protein; that of sorghum-fed fish to an increase in body fat. Increasing the sorghum ration per fish in densely populated ponds increased the growth rate and yield per hectare appreciably (again due to the fish's accumulation of body fat). Increasing the wheat rations produced no such effect, probably owing to a lesser utilization of (1) wheat carbohydrates for the accumulation of body fat and (2) wheat protein for gain in body protein. Thus wheat rations are more dependent on the supply of natural food to produce growth than are the other rations.

The authors conclude that increasing the rations of protein-rich diets in a densely stocked pond will increase yields; however, the protein utilization of the fish will be low. Further studies on the growth factors lacking in these feeds may lead to increased fish growth and better feed utilization.
[2 figures, 10 tables, 12 references] LB

9.19 (9.13) DECREASE IN DDT RESIDUES IN YOUNG SALMON AFTER FOREST SPRAYING IN NEW BRUNSWICK

Sprague, J. B. (Department of Zoology, University of Guelph, Guelph, Ontario, Canada), P. F. Elson (Fisheries Research Board of Canada, Biological Station, St. Andrews, New Brunswick), and J. R. Duffy (Science Department, University of Prince Edward Island, Charlottetown, Prince Edward Island, Canada)
Environmental Pollution 1, No. 3, 191-203 (January 1971)

Elson et al. (1967) described the effects on aquatic animals of the extensive program pursued in New Brunswick of spraying the forests with DDT from the air in the fight against spruce budworm. The present authors measured the persistence of DDT residues in stream ecosystems. The parr of Atlantic salmon (Salmo salar L.) were used as the touchstone.

Two- and three-year-old salmon parr were collected from 11 streams in the sprayed areas; controls came from a river in Nova Scotia where no spraying had been done. Fish from areas that had been sprayed 6 mo. previously had from 0.5 to 2 p.p.m. DDT in their whole bodies and from 2 to 4 p.p.m. DDE. The concentration of DDT in fish from streams sprayed about 2.5 years previously was low or undetectable; that of DDE decreased slowly over a period of 12.5 years. Total residue showed little or no relation to such factors as the strength of the DDT mixture applied or the number in all of yearly sprayings the river had been given. The relation of the total amount of all DDT residues (y) in parts per million to the time in years that the river was last sprayed (t) was expressed by the equation $y = 1.91/t$. Control parr had undetectable or trace (<0.01 p.p.m.) amounts of DDT residues--a surprisingly uncommon condition these days, say the authors.
[2 figures, 2 tables, 29 references] LB

9.19 (9.14) CONCENTRATIONS OF DIELDRIN IN THE BLOOD AND BRAIN OF THE GREEN SUNFISH, LEPOMIS CYANELLUS, AT DEATH

Hogan, Roger L., and Eugene W. Roelofs (Department of Fisheries and Wildlife, Michigan State University, East Lansing, Mich.)
Journal of the Fisheries Research Board of Canada 28, No. 4, 610-612 (April 1971)

D. I. Mount, M. L. Schafer, and L. W. Vigor [Science 152, 1388-1390 (1966)] established the long-term lethal level of endrin in the blood of the channel catfish, and suggested that the blood of the fish be used as an indicator tissue for endrin-caused fish-kills. The present study was carried out to establish the concentrations of dieldrin in the blood and brain of the green sunfish at death and to determine the relation between the concentration of dieldrin in the blood and in the brain.

The green sunfish were exposed to concentrations of dieldrin averaging 6 p.p.b. for from 124 to 139 hr. The amount of dieldrin in the blood at death was 6.0 µg./g.; the amount in the brain was 9.0 µg./g. The fish that survived the treatment but exhibited severe poisoning symptoms had higher concentrations of dieldrin in their blood and brain than did those fish that showed moderate to minimal symptoms.
[3 figures, 1 table, 9 references] FTP

9.19 TOXICITY AND TREATMENT OF DE-INKING WASTES CONTAINING DETERGENTS

Martens, D. W., R. W. Gordon, and J. A. Servizi
International Pacific Salmon Fisheries Commission Progress Report No. 25, ii + 24 pp. (1971)

Recently a mill on the Fraser River watershed that uses waste paper for manufacture of paperboard and building paper proposed addition of a de-inking mill to its existing operation. De-inking is essentially a laundry process consisting of loosening and defibering the paper stock and then washing the ink from the fibers with detergents. Thus the mill's wastes would contain fibers and organic matter derived from the ink and the paper as well as detergents. In addition, the proposed de-inking mill was to use both ledger paper and newsprint in its recycling operation--two different types of paper that would be processed separately and would result in the discharge of two different wastes. (However, the two effluents were expected to contain similar amounts of the same two proprietary nonionic detergents, Nalco 808 and Sterox MJ-b.) These two wastes would be added to that from the existing production line, making three different wastes in all. The authors' objects were (1) to measure the toxicity to juvenile salmon (Oncorhynchus nerka and O. gorbuscha) of de-inking wastes and the detergents they contain and (2) to evaluate biological and activated-carbon methods of treating these wastes to reduce their toxicity to the salmon.

The intense toxicity of the wastes to salmon was due primarily to their detergent content. Concentrations of detergents at less than the lethal level caused lethargy, excessive mucous secretion on the gills, and a lowered oxygen consumption of the salmon fry. Although the biochemical oxygen demand of the

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9.19 POSSIBILITY OF BIOLOGICAL DECOMPOSITION OF SOME HYDROAROMATIC COMPOUNDS

Pitter, P. (Prague Institute of Technology, Prague, Czechoslovakia), and M. Kozderkova (National Enterprise, Vratislavice nad Nisou)
Chemický Průmysl, No. 6, 279-283 (1970)
International Chemical Engineering 11, No. 1, 18-24 (January 1971)

This paper reports on an experimental study of the relationship between the structure of resistant hydroaromatic and cycloaliphatic compounds and the ease of their biodegradability. Degradability of the compounds was evaluated from the total amount of removable oxidizing potential and from the decomposition rate of the compounds. The biodegradability of 21 hydroaromatic and cycloaliphatic compounds was determined and compared to the degradability of 7 aromatic compounds and to that of glucose. The compounds tested were the only source of organic carbon for the microorganisms of the adapted inoculum (activated sludge). A synthetic biological medium was used for these tests.

Most of the hydroaromatic and cycloaliphatic compounds were easily degraded except the tetrahydrogenated derivatives of phthalic acid and phthalimide.
[12 figures, 1 table, 15 references] FTP

9.19 (7.43)(0.35) MEASUREMENT OF POLLUTANT TOXICITY TO FISH. II. UTILIZING AND APPLYING BIOASSAY RESULTS

Sprague, John B. (Biol. Sta., Fish. Res. Board Canada, St. Andrews, New Brunswick)
Chemical Abstracts 73, No. 18, 91021d (November 2, 1970)

9.19 (9.3) A SURVEY OF NATIONAL LAWS ON THE CONTROL OF POLLUTION FROM OIL AND GAS OPERATIONS ON THE CONTINENTAL SHELF

Utton, Albert E. (University of New Mexico, Albuquerque, N. Mex.)
Columbia Journal of Transnational Law 9, No. 2, 331-361 (Fall 1970)

This paper points out the weaknesses of existing regulations and law on the control of pollution from oil and gas operations in various coastal states (including the United States) in an effort to provide a basis for realistic recommendations for future courses of action. Major topic areas discussed are International Law Considerations; Regulations of Coastal States (other than the United States); Regulations of the United States; Requisites for Effective Regulation; and Recommendations.
[167 footnotes]

9.19 (8.42) MERCURY IN A COASTAL MARINE ENVIRONMENT

Burton, J. D., and T. M. Leatherland (Department of Oceanography, University of Southampton)
Nature 231, No. 5303, 440-442 (June 18, 1971)

Mercury in sea and river waters is reported as follows (data are expressed as µg. of mercury per l. of water): Test river, 0.009±0.0006; Itchen River, 0.010±0.001; Southampton Water, 0.010, and 0.013±0.001; Solent (off Calshot), 0.014±0.0008; and English Channel, 0.021±0.0007 and 0.015±0.0004.
[1 table, 17 references]

FTP

9.19 (0.8) ASNE DAY 1971 ISSUE

[A Symposium]
Naval Engineers Journal 83, No. 3, 7-143 (June 1971)

This special issue of the Journal contains papers presented at the ASNE Day 1971 Meeting of the American Society of Naval Engineers. The theme of the meeting was "Environmental Control--A Challenge to the Naval Engineer." Pertinent articles are "The Navy and the Environment," by John H. Chaffee (Secretary of the Navy), pp. 46-49; "Atmospheric Control in the Hyperbaric Environment," by Stephen D. Reimers (USN), pp. 50-65; "Environmental Control at Litton Advanced Marine Production Facility," by Walter W. Rody (Litton Ship Systems Division, Litton Industries), pp. 89-95; "The Environmental Protection Program of the U.S. Navy," by J. A. D'Eramo (USN), pp. 136-143.

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9.19 (7.22) EFFECTS OF 2,4- AND 2,5-DINITROPHENOL ON THE EMBRYOLOGICAL DEVELOPMENT OF THE HERRING CLUPEA HARENGUS

Rosenthal, H., and R. Stelzer (Biol. Anstalt Helgoland, Hamburg, Germany)
Chemical Abstracts 74, No. 7, 29366q (February 15, 1971)

9.19 [DECONTAMINATION OF RADIOACTIVE WATER WITH PEAT FILTERS]
DEKONTAMINIERUNG VON RADIOAKTIV VERSEUCHTEM WASSER MIT TORFFILTERN

Bezegh-Calántai, M.-M.
Schweizerische Zeitschrift für Hydrologie 32, No. 1, 226-270 (1970) (In German; English summary) (Birkhäuser Verlag, Basel, Switzerland)

Percolation experiments were run in ion-exchange columns in the laboratory and in pilot-scale installations to determine the decontamination capacity of three types of peat dug in the Jura Mountains. Decontamination of water containing ^{90}Sr-^{90}Y was good. Retention of anionically available ^{131}I was measurable at extremely low concentrations--$<10^{-9}$ Mol NaI/liter; retention increased exponentially as dilution ratios increased--a solution of $<10^{-12}$ Mol Na ^{131}I/liter had a retained activity of from 60 to 90% relative to the inflowing solution. One of the findings of particular note is the correlation between the calcium content or degree of decomposition and the exchange or breakthrough capacity for cations.
[23 figures, 11 tables, 22 references]

LB

9.19 de-inking wastes was easily reduced by biological treatment, the total wastes were not readily detoxified because of the detergents' resistance to detoxification. And, although the detergents could be removed from solution by activated carbon, such a method of treatment would be expensive, for excess organic matter and suspended solids would have to be removed by some type of pretreatment. Thus the mill's alternatives seem to be: (1) selection of detergents that will be readily detoxified during biological treatment of the waste or (2) selection of a method (such as the activated-carbon treatment) that will remove the detergents.
[2 figures, 8 tables, 15 references]

LB

9.2 (9.7) TECHNOLOGICAL TRANSFER AND SKILL CONSERVATION: A MODEST PROPOSAL

Siegel, Irving H. (PTC Research Institute, George Washington University, Washington, D.C. 20006)
Idea 14, No. 4, 597-600 (Winter 1970-71)

The author proposes the establishment of a temporary federal project that would link and advance two national purposes: (1) to help maintain our national resource of specialized manpower and (2) to facilitate productive industrial application of the research findings generated at a cost of tens of billions of dollars of public funds during the past 20 years.

Technological transfer could be expedited in two ways. The first way is to organize teams of persons who have had firsthand experience in the aerospace, atomic, or other government-aided industries, and to send them into the field for teaching, demonstrating, and exhibiting available processes, products, or materials. The second way is to use qualified teams to retrieve information from federal data banks and then abstracting, digesting, tailoring, or otherwise repackaging the results to meet the needs of probable or actual customers.
[5 references] FTP

9.3 (9.4) THE UNITED STATES DRAFT CONVENTION OF THE INTERNATIONAL SEABED AREA

Stone, Oliver L. (Shell Oil Company)
Tulane Law Review 45, No. 3, 527-545 (April 1971)

This paper analyzes the problems relating to oil and gas that the United States "Draft United Nations Convention on the International Seabed Area" causes. The author suggests that the Draft requires substantial revision before it can serve the need for a balanced regime acceptable to the largest possible number of nations and provide a realistic, stable, and workable system to generate the huge effort and investment required to explore the seabed and produce its minerals.
[169 footnotes] FTP

9.3 (9.17)(9.4) THE INTERNATIONAL SEABED AREA

Auburn, F. M. (University of Auckland, Auckland, New Zealand)
International and Comparative Law Quarterly 20, Part 2, 173-194 (April 1971)

The author examines the background to and discusses the provisions of the Draft Convention on the International Seabed Area submitted by the United States on August 3, 1970, to the United Nations Committee on the Seabed.
[157 footnotes] FTP

9.3 LEGAL REGULATION OF MINERAL EXPLOITATION IN THE DEEP SEABED

Stevenson, John R. (Legal Adviser, U.S. Department of State, Washington, D.C.)
Department of State Bulletin 65, No. 1672, 48-55 (July 12, 1971)

This article is the text of a talk made by the author before the Offshore Technology Conference at Houston, Texas, on April 19, 1971.

The fundamental objective of the United States oceans policy is to accommodate the legitimate interests and expectations of all states in a manner which will promote development of the minerals of the deep seabed and reduce the potential for conflict. In striving to obtain this objective, the United States has chartered a course which avoids both extreme nationalism or unrealistic supranationalism. The President's announcement on May 23 last year [The President's Ocean Policy Statement of May 23] and the draft convention [Draft United Nations Convention on the International Seabed Area] tabled in Geneva last August as a working document balance and reconcile the many diverse interests which often compete.

Insofar as control over mineral resources of the deep seabed is concerned, the coastal state is given extensive rights in its continental margin, but the international community's interests in preserving freedoms of the high seas, the integrity of the marine environment, and a reasonable sharing of the revenues from exploitation in the seabed are also taken into account. Likewise the composition and voting procedures in the Assembly, Council, and the judicial Tribunal [of the proposed International Seabed Resource Authority] have been constructed with an awareness of present-day technological and political realities.

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9.3 (9.19) THE INTERNATIONAL LEGAL ASPECTS OF POLLUTION

[A Symposium]
University of Toronto Law Journal 21, No. 2, 173-251 (1971)

This issue contains nine papers and one statement presented at a 3-day symposium on the international legal aspects of pollution. The symposium was held in Vancouver, B.C., Canada, in September 1970 under the sponsorship of the Faculty of Law of the University of British Columbia, the Canadian Branch of the International Law Association, and the Department of External Affairs of Canada. The articles are:

"The Pollution Problem," by Louis M. Bloomfield (Canadian Branch of the International Law Association), pp. 175-176.
"The Dimensions of the Environmental Problem," by Gerald L. Morris (University of Toronto), pp. 177-181.
"Unilateral and Multilateral Approaches to Environmental Problems," by John B. Yates (University of Ottawa), pp. 182-192.
"International Law and Pollution of International Rivers and Lakes," by C. B. Bourne (University of British Columbia), pp. 193-202.
"International Legal Aspects of Pollution of the Atmosphere," by E. G. Lee (Department of External Affairs, Canada), pp. 203-210.
"The Freedom of the Seas: A Licence to Pollute?" by L. J. H. Legault (Department of External Affairs, Canada), pp. 211-221.
"Prospective International Control of Weather Modification Activities," by J. W. Samuels (University of Western Ontario), pp. 222-225.

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9.6 MATHEMATICS FOR CHEMISTS

Perrin, C. L.
Published by John Wiley, Chichester, England (1971), pp. xiii + 452 pp., Price £5.75
Peacock, G. (reviewer)
Chemistry and Industry No. 21, 574 (May 22, 1971)

This book was written especially for chemists and it attempts to define and explain the use of mathematical methods common in chemistry today. A short note on the use of a computer and the language of logic is included in the appendices.
FTP

9.2 INTERNATIONAL WHALING STATISTICS LXVI
(1.953)

Jahn, Gunnar, Birger Bergersen, and Einar Vangstein (Universitet i Oslo, Institutt for Marine Biologi avd. A, Frederiksgt.3, Oslo 1, Norway)
Edited by the Committee for Whaling Statistics, Oslo, Norway (1970), 33 pp.

The report contains data on Antarctic whaling during the 1969-70 season. It was based on data sent to the Bureau of International Whaling Statistics, Sandefjord, Norway.
FTP

9.3 (9.19)

"Aircraft Noise in the Vicinity of Aerodromes and Sonic Boom," by Gerald F. Fitzgerald (International Civil Aviation Organization, Montreal, Canada), pp. 226-240.
"Policy on the Environment," by J. J. Greene (Minister of Energy, Mines, and Resources, Canada), pp. 241-246.
"Annex"[The Canadian Initiative to Establish a Maritime Zone for Environmental Protection: Its Significance for Multilateral Development of International Law], a statement prepared by R. St. J. Macdonald, Gerald L. Morris, and Douglas M. Johnston (University of Toronto), pp. 247-251.
FTP

9.4 ANTI-POLLUTION MEASURES -- IMCO SUBCOMMITTEE ON SHIP DESIGN
(9.19) (2.115) AND EQUIPMENT

Price, R. I. (U.S. Coast Guard, Office of Merchant Marine Safety, Washington, D.C.)
Marine Technology 8, No. 1, 1-7 (January 1971)

This article is a report of proceedings of the Subcommittee on Ship Design and Equipment of the Intergovernmental Maritime Consultative Organization considering features to be incorporated in ships to prevent or mitigate pollution by oil or hazardous chemicals shipped in bulk.
[1 figure, 5 references]
FTP

9.3 (9.19) (9.4) THE NEW CANADIAN DECLARATION OF ACCEPTANCE OF THE COMPULSORY JURISDICTION OF THE INTERNATIONAL COURT OF JUSTICE

Macdonald, R. St. J. (Faculty of Law, University of Toronto, Toronto, Ontario, Canada)
Canadian Yearbook of International Law 8, 3-38 (1970) (Faculty of Law, University of British Columbia, Vancouver 8, B.C., Canada)

This paper is a systematic analysis of a new reservation to Canada's acceptance of the compulsory jurisdiction of the International Court of Justice relating to those areas of the law-of-the-sea which are undeveloped or inadequate. The author also offers specific suggestions for a new document that may prove to be more satisfactory in the future.
[98 footnotes]
FTP

9.2 WHERE ARE THE AMERICANS?

Gauer, David D. (Washburn University), and Harold L. Rice (Stanford University, Stanford, Calif.)
Washburn Law Journal 10, No. 2, 214-236 (Winter 1971) (School of Law, Washburn University, Topeka, Kan. 66621)

The authors claim that the response of the United States private sector to problems of international development and poverty area development has been disappointing to policy makers of our nation. They propose a solution especially adapted to the needs of the less developed nations. Their approach calls for an integrated system for initiating developments by private sector entities, allowing these private sector taxpayers to allocate a portion of their income taxes via a new public-private corporation to high risk but high potential development projects. The consequences of this concept, they state, would be an acceleration in development progress through more individual initiative and less direct government involvement.
[16 footnotes]
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9.3

There is no perfect solution to the problem of control over the resources of the deep seabed, but the United States does believe that it has offered a balanced and equitable approach conducive to a solution of this complex question. We shall continue to welcome the views and seek the cooperation of the industries represented at this Offshore Technology Conference in further developing and refining the position of our Government in preparation for the 1973 Conference on the Law of the Sea.
Reprinted in part

0.12 (2.3) CONTINUOUS PROPORTIONING FOR THE FOOD INDUSTRY

Zanetti, R. R. (Merrick Scale Mfg. Co., Passaic, N.J.)
Instrumentation Technology 18, No. 3, 42-46 (March 1971)

Application of special feeding devices and systems increases the benefits derived from continuous process operations. This article deals with weigh feeder systems that proportion (solid) foods.

An unusual application of gravimetric feeders, the author notes, involves maximizing the output of a continuous freezer operation. A signal from a temperature sensor in the freezer controls the rate of feed of the material to the freezer, thus eliminating overloading of the freezer by improper feeding. FTP

6.37 GELLING COMPOSITIONS

Horn, L. J.; Kraftco (pat.)
U.S. Patent 3,563,769
Food Technology 25, No. 6, 70 (June 1971)

Mixtures of polysaccharide gums (extracted from seaweed) and high methoxyl pectin are used in artificially sweetened food products. FTP

3.237 FISH STICK PRODUCTION

Schjolberg, E. (pat.)
British Patent 1,214,667
Food Technology 25, No. 6, 62 (June 1971)

Frozen fish meat is granulated; the granulated material is formed into a flat body and divided into portions of the desired shape; and then the portions are breaded while frozen. FTP

9.7 SURVEY OF THE WORLD AGRICULTURAL DOCUMENTATION SERVICES

Buntrock, H. (Centre for Information and Documentation, European Communities, 29, Rue Aldringer, Luxembourg, Belgium)
EUR 4680 e, 55 pp. + 3 appendices (December 1970)
Food and Agriculture Organization of the United Nations, Rome, Italy

The Food and Agriculture Organization of the United Nations has established a Panel of Experts to study the desirability and feasibility of setting up, under the aegis of FAO, an International Information System for the Agricultural Sciences and Technology (AGRIS). Preliminary studies were carried out in 1970 by an ad hoc study group composed of experts from several information services and documentation centres. This study group considered that an essential element on which to base the detailed study for AGRIS would be as exhaustive as possible a survey of existing information services and documentation centres in agriculture and related fields. The present report contains the preliminary results of this survey, which has been carried out through cooperation of the members of the study group under the coordination of the Centre for Information and Documentation (CID) of the European Communities. (Introduction, by G. Dubois of FAO, reprinted in part)

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